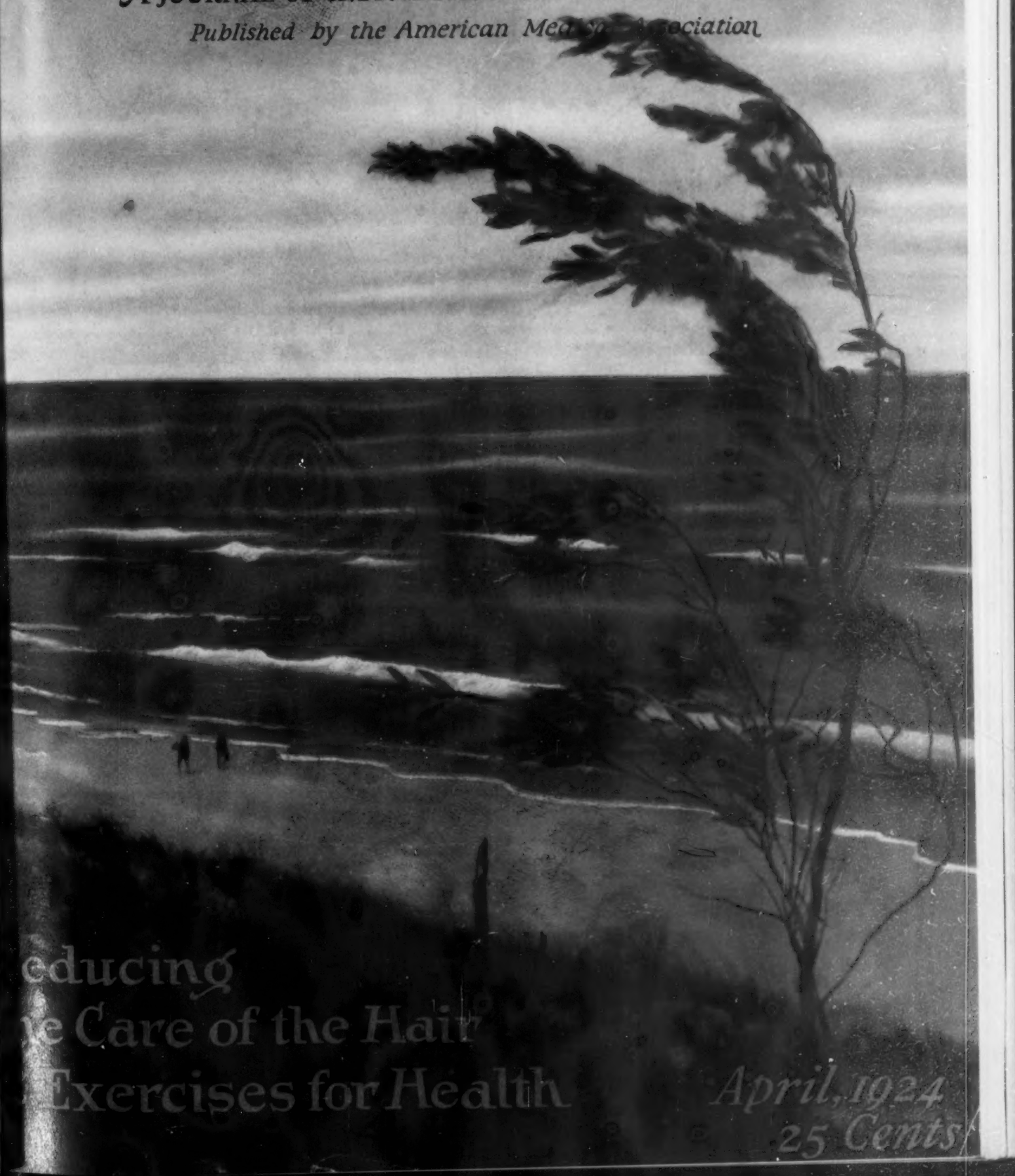
HYGEIA

A JOURNAL OF INDIVIDUAL AND COMMUNITY HEALTH

Published by the American Medical Association



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April, 1924

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HYGEIA

A JOURNAL OF INDIVIDUAL AND COMMUNITY HEALTH

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APRIL CONTRIBUTORS

DR. JESSE F. WILLIAMS of the department of physical education, Columbia University, is the author of several books and many magazine articles on physical training and healthful exercise. DR. L. M. DAVIDOFF is a physician who has a keen sense of humor and a helpful message to the fat.

DR. JULIAN W. BRANDEIS is an authority on heredity. DR. HERMAN GOODMAN is a specialist in skin diseases. EVELYN G. HALLIDAY is connected with the home economics department, school of education, University of Chicago.

HARRY HANSEN and DR. MORRIS FISHBEIN have again collaborated in reviewing health books for HYGEIA. Mr. Hansen is book editor of the *Chicago Daily News* and *Harper's Magazine*. Dr. Fishbein is associate editor of the *Journal* of the American Medical Association and a member of the editorial board of this publication. WILLIAM BYRON FORBUSH, Congregational minister and author, contributes largely to general and class publications.

DR. GEORGE H. WEAVER is head of the staff of the Anna Durand Hospital of the John McCormick Institute for Infectious Diseases, Chicago. DR. WILLIAM H. PARK, as a member of the city health department of New York, directed the giving of the Schick test for diphtheria to 90,000 school children last year.

DR. CHARLES H. KEENE is director of the Bureau of Health Education of the Department of Public Instruction of Pennsylvania. DR. E. J. HENRYSON is a physician interested in public health education. DR. EMERY R. HAYHURST is a professor of public health in the Ohio State University and an official in the Ohio State Department of Health.

FRANK THONE of Des Moines, Ia., is a doctor of philosophy and writes for various magazines. MARGARET POPE HOVEY tells the story of her own invalidism after infantile paralysis and her remarkable recovery. DR. RALPH A. KINSELLA is connected with a school of medicine.

The May issue:

"Each year I have become more convinced that in well conducted boys' camps is to be found one of the surest means of adding to the health of the boys' bodies, minds and souls," says WILLIAM H. MATTHEWS, *director of Family Welfare, New York City. In his article "Boys' Camps" in the May issue, Mr. Matthews gives many reasons why boys want to return each year to the summer camps.*

The late DR. JOHN B. HUBER *humorously relates the troubles of the Easybird family of Stingemhurst, and how they helped to rid their home town of the mosquito plague.*

In this day and age parents are unwilling to allow babies to be babies and young children to be young children. In the May issue of HYGEIA, DR. JOHN LOVETT MORSE *gives some good reasons why children should not be overtrained.*

Contributions to* HYGEIA *are considered, and, if accepted, paid for. Stamps for the return of unaccepted manuscripts should be enclosed. All communications should be addressed to* HYGEIA, *535 North Dearborn Street, Chicago, Illinois.

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L. A. Toriello

Fig. 1

The Rules of the Game

Part II—Twelve Exercises for Health

JESSE FEIRING WILLIAMS

ALL persons should exercise daily. Our present ruinous policy of education, which permits children to grow up without the essential organic and nervous development required by our racial inheritance, makes imperative the setting aside of some time by all for recreation and physical exercise. The kind and amount of exercise needed varies for different workers.

Exercise should be adjusted according to occupation and individual needs. Gardening, walking (aimless strolling is not worth much as exercise), swimming, camping, horseback riding, hunting, tennis, handball, bowling, ball games and golf are generally beneficial.

Many persons are prevented by circumstances, often fixed, at times modifiable, from indulging in the necessary exercise. These will be helped greatly by daily practice of exercise at home.

In presenting a series of exercises for this group, it is important to emphasize certain limitations. Such a series does not represent a complete system of physical education. At best it is only a substitute for more wholesome exercise out of doors in the form of games and recreative sports. The following points, therefore, should be noted:

1. Health exercises as a rule have been devised to produce effects which could be felt by the person taking them. The idea that exercise must be *felt,* in order to be valuable, is similar to the idea that medicine must have a nasty taste and a mysterious color in order to be potent. On the contrary, the most desirable sort of physical education will not produce soreness, and will in no way strain the muscles.

2. Exercises usually offered to the public are based on artificial and unnatural movements of the Swedish and German systems. It should be appreciated more generally that the movements which man has made, in developing from the lower forms of life into the human being that he now is, are more suited to his needs than movements which are wholly unrelated to his racial inheritance.

3. Many of the exercises often proposed in systems of gymnastics are distinctly harmful. For example, the human being should not bend the trunk backward (except in corrective gymnastics, where the support is controlled), and breathing exercises which have no relation to physiological needs of the body are distinctly unhygienic.

The exercises that follow are natural movements; hence they are offered with the belief that they will be of some value to the sedentary worker in school or office. They will serve to provide some activity of a *natural* kind, and should be supplemented with as much wholesome out-of-door exercise as possible.

Fig. 2

They do not represent a complete system of body building. They are not devised to meet the play requirement of children, nor the recreative needs of adults. They will set up the body, but they will not restore a damaged heart, nor bring strength to a paralyzed muscle. They will help, however, in securing good posture, but they will not cure a tuberculous spine. They will not remove freckles from the face, nor will they revive falling hair.

These exercises should be performed on arising in the morning, and should be followed by the morning bath. They are devised to produce wholesome effects upon circulation and respiration, and to aid digestion and elimination. Since they are planned to secure an uplift of the body in all the movements, the accent should be upward. In addition, the trunk muscles are vigorously worked, and the correct use of the foot is favored. Exercise 1 should be practiced during the day, in all standing positions.

Standing (Fig. 1)

The standing exercise (Fig. 1) is used to help in achieving a good standing posture. Much of the posture work in schools is bad, on account of the rigid and unnatural position attained. The body is too frequently put into such a posture that the relation of parts prevents quick and controlled action. One should seek to attain, in standing, an erect position, without rigidity, thus insuring healthful functioning of abdominal organs, proper use of joints, and efficient use of the musculature of the body.

Exercise

Stand with the feet parallel to each other, and 6 to 8 inches apart. Place one foot (either one) 3 to 4 inches in front of the other. Have weight on both feet disposed to their outer edges. The position of the feet produces balance and control. Push the trunk upward and lift the abdominal wall upward. Retain a feeling of relaxation in the shoulders, but secure a sensation of extension and lengthening of the body without contracting or tensing the muscles (Fig. 1).

Guides in Performance

1. Avoid rigidity.
2. Secure straightening of the spine but keep the shoulder muscles relaxed.
3. Keep the weight off the heels.

4. Pull the abdominal wall upward and keep the lower half of the abdominal wall constantly flattened.

Stretching (Figs. 1 and 2)

This is a natural movement that straightens the spine, lifts the chest and overcomes the sagging of the abdominal muscles so commonly seen in adults.

Fig. 4

Exercise

On the count *One!* push the arms easily upward and rise on the toes as far as possible. Reach up as far as possible, as if trying to get an object from a high place (Fig. 2).

On *Two!* let the arms sink and the heels touch the floor, but retain as long as possible the sensation of extension (Fig. 1). Do not let the body droop. The development of the proper muscle sensation is important.

Guides in Performance

1. Avoid tenseness and rigidity.
2. Do not bend backward.
3. Avoid angular movement of the arms. Do not swing them up; push them up.
4. Perform with a feeling of relaxation rather than contraction.
5. Repeat the movement 10 times. (In the beginning, 2 or 3 times is sufficient for all the movements which are to be repeated.)
6. Do not execute the movement rhythmically, for in rhythmical exercises it is more difficult to get the correct form at the end of the movement. The form in this movement is important.

Throwing (Figs. 3 and 4)

This is a natural movement used by man in throwing a ball at an object. In learning movements that involve complex coordinations, do not think of the end of the movement, but keep clearly in mind the means to that end. Follow closely the directions for arm, leg and trunk movement, and the coordination will come.

Fig. 3

This movement is a powerful trunk exercise. It uses the back and side muscles, and brings into play the large muscles of both arms and both legs.

The first part of the movement (Fig. 3) corresponds to the second part (Fig. 4) in position of trunk and legs. If the arms in Fig. 3 were placed in the position shown in Fig. 4, the similarity in the two parts of the movement would be instantly apparent.

Exercise

Stand with feet about 24 inches apart, and with the left foot about 6 inches in front of the right. On *One!* clasp hands lightly, waist high, as shown in Fig. 3, shift weight to the right foot, bend the right knee, draw both hands to the right, twist the trunk to the right, and turn the head to the right. The left leg is straight and relaxed, and the left heel is off the floor. The trunk is inclined forward (Fig. 3).

On *Two!* throw with the right hand, twisting the trunk sharply to the left. The left knee is bent, and the right knee is straight, with the heel off the floor. Notice that the body forms a straight line from head to right heel (Fig. 4). The weight has been transferred to the left leg. The right arm is forward and the left arm back (Fig. 4). The force of the throw turns the body in Fig. 4 a greater distance than in Fig. 3, and so the left foot is turned in the direction of the throw.

Guides in Performance

1. Avoid angles and sharp tensions in the movement.
2. Make all movements flowing, smooth and harmonious.
3. Avoid conscious contractions. Do not try to contract the muscles. Perform the movement as described, and the muscles will contract to carry out your desire.
4. Repeat the exercise ten times. At first separate it into two parts. After it is learned make it continuous, and change from the position in Fig. 3 to that in Fig. 4, and back to the position in Fig. 3 without interruption.

Fig. 5

5. After strength and power are developed, the movement may be performed rhythmically 20 times.

Lifting (Figs. 5, 6 and 7)

This is a natural movement used in lifting an object from one side of the body to the other, or from a low level to a higher one. It is an exercise of the back and legs, and may be made very vigorous by reaching low and lifting high.

The movement as given has two phases: low lifting and high lifting.

Exercise of Low Lifting

Stand with feet 24 to 28 inches apart, parallel and with the weight disposed to their outer edges. On count *One!* bend the right knee and reach with arms to the right of the right foot about 12 inches from the floor (Fig. 5). The left leg is straight, the back is flat, and the movement occurs in the hip and knee joints. On *Two!* transfer the weight to the left foot and lift the object secured in command *One!* to the left, and into the same relative position as in Fig. 5. Then the left knee will be bent, the right leg straight, and the arms will be to the left of the left foot about twelve inches from the floor.

Fig. 6

Exercise of High Lifting

On *One!* assume the position shown in Fig. 6. The hands reach the floor and there is greater bending in the right knee and hip joints. The back remains flat, and the left leg is essentially in the

same position as shown in Fig. 5.

On *Two!* lift the object to the left and place it high above the head (Fig. 7). Vigorous muscular extension should occur in this part of the movement, while the weight is being shifted to the left foot, and the right leg is relaxed with the right heel off the ground.

Start the high lifting part of the time on the left and part of the time on the right.

Fig. 7

Guides in Performance

1. Avoid tenseness in the movement, seek smoothness and constantly adjust the body in the different parts of the exercise by comparing the movement with the illustration.
2. Secure uplift of the body in the high lifting, and get the complete extension that would come in placing a box on a high shelf. (In Fig. 7, the upward pull of the trunk is indicated in the vertical folds of the shirt.)
3. Repeat ten times with each lift.

Climbing (Figs. 1 and 8)

Climbing has always played a prominent part in the history of man. Our arboreal ancestors excelled in it, and our children today, at an early age, seek to recapitulate their racial history in the same action.

This movement is a powerful exercise for the legs, and secures strong contraction of the abdominal muscles. As shown in Fig. 8, it represents reaching upward and grasping an object, as a limb of a tree or ladder rung, and pulling up on one leg to obtain support preparatory to pushing up the body. The arm movement is identical with the stretching exercise.

Fig. 8

Exercise

On *One!* reach upward with the arms, raise the right knee forward and push the body upward on the ball of the left foot. Secure vigorous stretching upward. This is to be the accented part of the movement (Fig. 8). On *Two!* return to standing position (Fig. 1).

Guides in Performance

1. Be careful not to drop on *Two!* Keep the erect position as shown in Fig. 1.
2. Accent the count *One!*
3. The movement may be performed rhythmically, but the rhythm should be slow, and the accent always on the upward movement.

Walking (Figs. 1 and 9)

The walking movement represents a natural exercise performed with movement of the opposite arm and leg. The act should be executed with the feet parallel, and with the weight on their outer edges. The illustration (Fig. 9) exaggerates the natural movement in some of its phases, but should be practiced as shown (Fig. 9) to secure the freedom in walking that is desired.

Fig. 9

Walking can be something more than a means of progression. Smooth arm movement and vigorous leg action will bring exhilaration into an act that is frequently rendered difficult by improper habits and clothing.

Exercise

On *One!* raise the left knee forward and swing the right arm forward. The body remains poised on the ball of the right foot (Fig. 9). On *Two!* reverse the position of arms and legs.

Guides in Performance

1. Keep the accent upward.
2. In walking avoid the pounding of the heels on the floor. The heels strike first always, but the accent of the movement should be upward and forward, never downward.
3. This movement is not to be confused with the aimless strolling that is seen so frequently.
4. The rhythmical and continuous walk is used as soon as the idea of the arm and leg movement is comprehended.

Running (Figs. 1 and 10)

This is a natural movement performed on the balls of the feet with vigorous thrusting upward of the knees and free and vigorous swinging of the arms (Fig. 10). It will be noticed that the right arm is forward when the left knee is forward. This opposition in walking and running is a fundamental compensation in the movement of the body to secure proper balance, direction and control.

Fig. 10

This exercise vigorously stimulates the circulatory and respiratory systems, and will aid in improving all the functions of the organs supplying the body with energy. It should be possible for one to run and enjoy the movement (Fig. 10).

Exercise

On *One!* swing the right arm forward and thrust the left knee upward and forward, at the same time pushing the body upward on the ball of the right foot.

On *Two!* reverse the position of the arms and legs, and push the body up on the ball of the left foot.

Guides in Performance

1. Run a few times at first. After power and endurance are developed, the run should be continued for several minutes.
2. Accent the upward movement. Do not strike the floor hard on the down stroke.
3. After the coordination is learned, the run should be executed in rhythm.

Fig. 11

Jumping (Figs. 11 and 12)

To clear an obstacle or grasp an object above one's standing reach, one resorts to jumping. This is therefore a natural movement, and it should be performed naturally.

The first part of the movement (Fig. 11) uses the muscles of the entire body, and in the second part (Fig. 12) the body is thrown into the air by the vigorous contraction of leg, back and arm muscles. In the continuous jump, the landing position, shown in Fig. 11, serves as the start for the next jump. At first the movement should be practiced without the jump.

Exercise

On *One!* bend the knee and hip joints, and incline the body forward (Fig. 11). Swing the arms downward and backward, elevating the heels slightly. Note that the trunk is inclined and not held in the upright and unnatural position sought in some gymnastic systems. On *Two!* swing arms forward and upward, and spring into the air (Fig. 12). The landing follows as a result of the movement, and should assume the position shown in Fig. 11.

Fig. 12

Guides in Performance

1. Before trying to jump, the movement of preparation (Fig. 11) should be practiced until the muscles are strong enough to jump without straining them.

2. At first, only make one jump (Fig. 12). Land with the knees bent and the heels off the ground.

3. Secure lightness in the movement and avoid landing heavily.

4. After the strength of the legs has been developed, continuous jumping should be performed. Gradually increase the number of jumps from one to five or six and more.

These, then, are twelve exercises for health.

What to Do for Measles

HERE are a few facts which everyone should know about measles. They are taken from the monthly bulletin of the Louisiana state board of health.

1. A child in the early stages of measles may easily infect a large number.

2. After being exposed, measles does not develop for a period of from nine to twelve days.

Symptoms

The first symptoms of measles are:

1. Eyes, red and watery.
   Eyelids puffy and eyes sensitive to light.

2. Child feels drowsy and irritable; may complain of feeling chilly; may have a chill; likely to be feverish.

3. Hard palate and back of throat take on a dull, angry, red color. Maybe a few little red spots on the hard palate, and on the cheek inside there may be some small, white-tipped, reddish spots.

4. The child will be restless and thirsty.

5. After three or four days of these manifestations, little red spots will appear on the hair line and within twenty-four hours this rash will have spread over the body. (In from five to seven days the rash will begin to fade and in three or four days will be entirely gone.)

What to Do

1. Keep the child in bed as long as there is any fever or cough.

2. Cover should be light but warm, as a chill from cold or drafts may dispose to pneumonia.

3. Keep people away from the patient, especially anyone having a "cold."

4. Give light, nutritious food, broths, soft boiled eggs; pasteurized milk and a little iced lemonade may be good.

5. It is very necessary to keep the room darkened for the protection of the eyes of the child.

6. Call the family physician—measles is a grave disease.

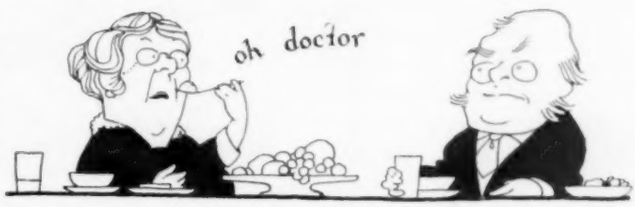
As soon as scaling is complete and discharges from eyes, ears and nose have disappeared the child may go with others or return to school.

As soon as it is known that measles exists in a community no children with a "bad cold" should be allowed to come in contact with other children.

Now This Matter of Reducing Weight!

L. M. DAVIDOFF

MY DEAR, not another calorie! Please don't insist, Sylvia, I hate to appear impolite. Doctor, won't you *mate her ftoph ftuffin' me——?*" By this time the lady at my left had filled her mouth so full of pastry that the rest of her sentence was incomprehensible.



Great heavens, it's not that I object to people eating pastry, but why should they try to explain that they are on "the strictest kind of a diet" when their mouths are stuffed? Besides, I dislike people who talk while eating.

Not Far from Cud-chewers

And therein lies my inspiration to write on the subject of diet, for since the national craze to reduce has come into vogue, the evil of talking while eating has increased to such an alarming extent that one is hardly safe in visiting his most intimate friends—meal times or other times.

Between this pernicious practice, and gum-chewing, which, incidentally, has recently been on the ascendency from similar causes—the race seems to be in immediate danger of skipping the anthropoid stage in an atavism that will land it within a few generations among the mild-eyed cud-chewers.

But some one will undoubtedly ask why an effort to regain the proportions of Venus should be the cause for so much full-mouthed garrulity. The answer can only be speculative, and your guess is as good as mine.

Perhaps the plump ladies, bless their hearts, can blunt the prick of conscience when eating an extra piece of cake by talking louder and faster than the small voice from within. Or possibly they have even discovered in it a method whereby they can distract the digestive juices sufficiently to permit a gross or two of calories to pass on to ineffectiveness.

At any rate, I simply want to call attention to the fact that the relationship of talking to eating is growing daily more intimate, and exactly among those very ladies who have joined the cult of the sylphs.

But to the point! Let us carefully examine a "typical day" of a woman between the ages of 30 and 50, five feet one and one half inches tall, weighing 176 pounds, in the early course of an infection with the *Bacillus reductiensis:*

The night following exposure to the disease is usually a restless one. The wildest dreams race through the patient's head about stylish tailor-made clothes, tennis games, narrow waists, girlish figure, and tying her shoe laces in comfort.

The morrow finds her pale with want of sleep, and grim with decision. Breakfast is stoically refused, and this amazing behavior forces an explanation to John and the children, which is delivered in no uncertain terms. As the meal progresses, she strengthens her resolution with a second cup of black coffee without sugar, and—"no, no, no, not another thing, except perhaps a single slice of unbuttered toast."

Then follows the first long vigil between breakfast and lunch time. The strange emptiness in the pit of the stomach would almost be bearable if it weren't for the headache and dizziness. But nothing good comes about in the world without labor and pain, and she holds to it bravely until the lunch is on the table.

Then, heaven be praised, hunger has disappeared, or at least, there does not seem to be sufficient strength remaining to eat. At all events, this meal is a triumph. But before half an hour is past "the gnawing at the vitals" has gained its second wind, and that woman is indeed heroic who does not yield to a dish of rice pudding that the cat has graciously left untouched.

Talking-eating Complex Appears

If she gives way at this point, the "talking-eating" symptom complex makes its appearance simultaneously; if not, it does not appear until a day or two or three, or a week later. Then the tug begins between the spirit that's willing

and the flesh that's weak. And Old Harry stands by, shaking his sides, with the cloven hoof on the lever that opens the flood gates of speech, for the faster she talks the more she eats without being entirely aware of it. This reaction becomes almost an unconscious reflex, stimulated by a misdirected instinct for self-preservation.

Thus the whole process of nature becomes reversed. She eats relatively little at meal times, and relatively much in between. And really, the beastly scales are discouraging to any honest effort to reduce!

Now lest I seem unjust in depreciating a praiseworthy attempt, granting even that it is not carried out entirely to the letter, let me fortify myself with the same, much mishandled and misquoted calories.

What, in the first place, does a healthy individual of average size and average activity require in calories?

Authorities on this subject are not in complete agreement, but generally speaking about 2,300 to 2,800 calories per day for women, and 2,800 to 3,000 calories per day for men, each doing an average amount of physical work, is more than ample.

Suppose that the lady above described reduces her food intake at meal times to about two thirds, or even one half her normal requirements—that is certainly treating her generously—let us consider for a moment what her extra tidbits amount to in the course of a day.

Tidbits Mount Quickly into Calories

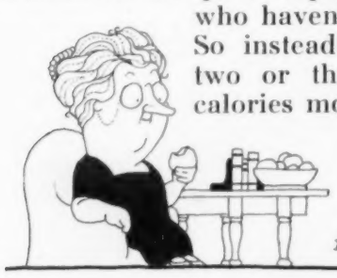
A pound of chocolates even though it is made to last over four days will be equal to about 800 calories a day.

Tea with sugar and without cream—afternoon tea has become extremely popular, by the way—adds another 40 calories.

One cup-cake with the tea raises the total by 150 calories.

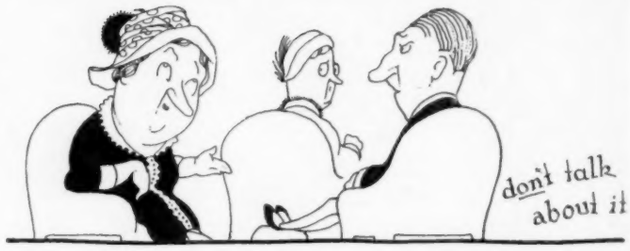
Tasting the dinner, eating the extra frosting, "not wasting" the extra whipped cream, etc.—let us be fair—say, only 200 calories more.

Then it is such a shame to throw away perfectly good food that is left over from meals! Think of the poor orphans across the water who haven't even bread enough! So instead of the garbage pail, two or three or four hundred calories more.



the "apple a day"

The "apple a day" is religiously eaten



with a resulting addition of 50 calories.

If it is theater night, an ice cream soda, for old time's sake, betters the intake by 350.

If it is club night, or bridge night, or sewing circle night, or church social night, two or three delicate cheese sandwiches with hot chocolate and whipped cream—500 CALORIES!

What to Do to Reduce

What, then, is the solution to the question of diet? How is one to reduce weight if this becomes necessary or desirable? The answer is quite simple:

1. Since it is nobody's business except your own, keep it to yourself. Don't talk about it, don't compare notes, don't look for sympathy or act the martyr.

2. Eat *moderately* at meal times. And—

3. *Take nothing between meals except water!*

Having shot my bolt, I should like to hang up my bow at this point, but it will perhaps be of value to define the word *moderately,* in terms of what to avoid.

Nearly everybody knows that food in the form of fat has more than twice the caloric value than other forms. Therefore, butter, cream, fat meat, olive oil and pork fat should be avoided. The other thing to remember is that concentrated food without bulk multiplies the calories alarmingly; therefore, sugar, cakes, candies should be, within reasonable limits, on the taboo list.

You Can Add or Subtract from This

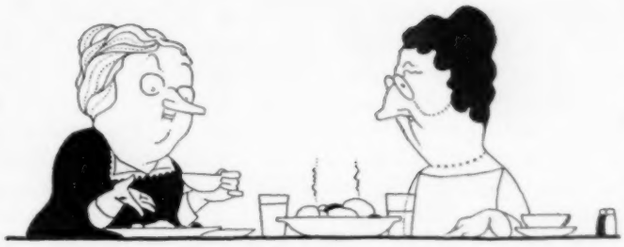
Finally, let me give a sample of what may be called a basic diet of approximately 2,000 calories:

Breakfast
- Orange (1)
- Omelet (1 egg)
- Toast (1 slice)
- Butter (1 teaspoonful)
- Cocoa (½ milk, ½ water, 1 teaspoonful sugar)

Luncheon
- Corn à la Southern (½ cup)
- Fruit salad—mayonnaise (½ cup)
- French roll (1)
- Butter (2 teaspoonfuls)
- Milk (¾ cup)
- Sugar cookies (2)

Dinner
- Cream of pea soup (3/5 cup)

Croutons (½ doz.)
Lean roast beef (1 slice)
Baked potato (1 medium)
Tomato salad (French dressing)
Saltines (1)
Tapioca cream (1 cup)



Now take this diet and cross out the butter, sugar, and cookies, and you have reduced it to 1,600 calories—a diet which, if taken while moderately active physically, will reduce weight. With this as a criterion the calories can be added, subtracted or changed to approximate the same value. Simply add soup, subtract butter, replace potato by a slice of bread, etc. It is not so difficult, is it?

What Do We Inherit?

JULIAN W. BRANDEIS

NO doubt it is a gambling instinct that makes the thriftiest and least avaricious among us waste a perfectly valuable hour, now and then, in fanciful speculation on the chances of an inheritance from some far-removed relative that we have never seen and most likely will never hear from.

It might prove more profitable to spend this same time in a consideration of just exactly what that ancestor has already bequeathed or, better say, perhaps, bestowed upon us.

Worldly goods, do we mean? No, indeed! We refer to something far more important, interesting, and valuable—to this ancestor's influence in determining and affecting our bodily state. In short, how far does heredity enter into the determination of health and disease?

Any one of us, from personal observation, alone, is able to recall some instance or other which indicates the operation of a law of heredity.

Lock of White Hair an Inheritance

Perhaps it is the occurrence of red hair in various members of the same family, of a single lock of white hair, or of a bad temper. No doubt it was just such trivial matters as these which first focused scientific attention in this direction.

In the year 1859, the epochal work of Darwin, "The Origin of Species" appeared, and until eternity his name will remain linked with the idea of evolution. For the decade following, his views were on trial, principally in the hands of the experimental breeders.

Then there followed a period of apathy. The very magnitude of Darwin's achievement reacted as a paralyzant to progress. Theories sprouted and grew by the wayside, strangling off the budding flower of fulfilment. Of course, among the mass of idle speculations, here and there appeared an idea that has left an indelible mark on the views of heredity as now accepted, but in the main, for thirty years following 1859, as Bateson put it, "evolution and the question of heredity became the exercising ground of the essayists."

Then came Galton, who, in 1897, proclaimed his well-known, but no longer tenable, law of heredity. In brief, he declared that to the total heritage of the offspring, the parents contribute one half, the grandparents one quarter, the great-grandparents one eighth, and so on, up to the total of unity.

Galton's conclusion was based on the results of breeding experiments with hounds, and there can be no doubt that they showed a mathematical approximation to the expectations according to the now accepted laws of heredity. There sprung into being, at once, a host of followers who devoted themselves to an elaboration and an extension of Galton's work.

But, even as they were deep in the midst of their figures a clarion note resounded through the halls of science, distracting them from a task to which they were destined never to return. The laws of heredity, as enunciated by Gregor Mendel in the year 1866, had been rediscovered and proclaimed to the world by three independently working scientists. Correns, De Vries, and Tschermak, each at work far away from the other, were able fully to confirm the results obtained by the little abbé, thirty years before, at Brünn, in the garden of the Königskloster.

Mendel Worked Out Law with Peas

In his experiments Mendel employed the ordinary edible pea. He succeeded in crossing a tall variety, which attained an average height of six feet, with a short variety, which averaged about one foot in height. Then he followed the offspring through many generations, studying the outcome in regard to a

number of special characteristics, such as height, distribution of flowers on the stem, color of the unripe pod, shape of the seed.

His enthusiasm and infinite devotion to the task were well rewarded, as he was able to deduce from his observations a group of very simple laws, which are styled the Mendelian laws of inheritance. These are generally accepted today as a mathematical expression of hereditary expectation.

If we follow his experiments through with our attention focused on the results obtained in regard to the height of the plants, alone, the matter will assume a clearness and simplicity which are really most appealing. Let us begin, then, with a chart which represents this feature.

As parents, then, he chose two varieties which differed markedly in regard to height and, by means of a simple procedure, he crossed them.

What a "Tall" and a "Short" Breed

The first generation resulted, as seen in the chart, in tall offspring only, all adhering to the height of the one progenitor. From the fact that tallness declared itself in this cross, while shortness receded from view, he called tallness a dominant character, as opposed to shortness, which he called recessive.

The plant in question is self-fertilizing, and a second generation appeared in which the "talls" outnumbered the "shorts," three to one. This generation was again allowed to fertilize itself, a study of separate members of the second generation being conducted, and a third generation came into being.

It was now found that the dwarfs of the second generation produced nothing but dwarfs, and this continued on into all succeeding generations. In other words the "shorts" of the second generation were recessives that bred true to the character "short." The "talls" behaved in two ways: one third of them produced nothing but tall offspring, and through succeeding generations bred true to this dominant character, while two thirds of the "talls" (indicated as TS in the chart) produced in the third generation three "talls" and one "short," each.

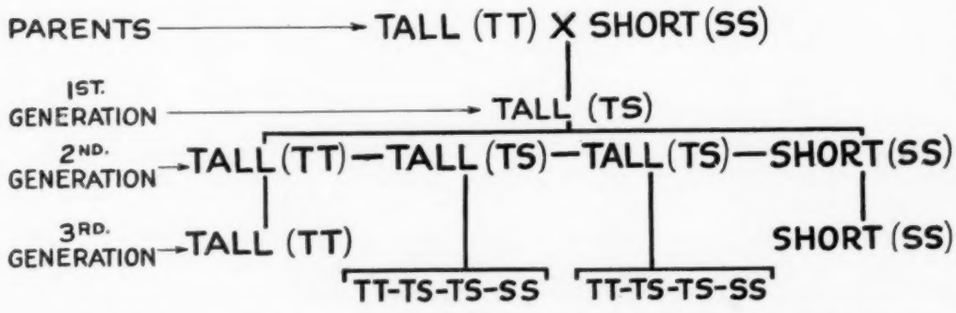


Chart I. What happens when a very tall man marries a very short woman? All their children are apt to be tall, but these children will possess the factor for reproducing both tall and short offspring.

Mendel's conclusion from these results was a perfectly simple and logical one, which exists today as the keystone of his entire theory.

One of the original, pure-breed parents carried in its germ cells the factor to produce the character "tall"; the other carried in the germ cell the character "short." The resulting first generation, while appearing as dominant "tall," harbored within themselves both the factors for producing "talls" and "shorts"; in other words, were TS in make-up.

Now when these factors passed into the germ cells of the first generation, they segregated, that is, the factor for producing "talls" passed into fifty per cent. of the germ cells, and the factor for producing "shorts" passed into the other half of the germ cells, *but no germ cell carried both factors.* Thus Mendel denominated the law of segregation. Thus we have developing in the second generation: TS × TS = TT-TS-ST-SS with all those bearing the character "T" appearing as dominant, or tall.

Now, to proceed, it is evident that in respect to any pair of opposed hereditary traits, the entire population of the world must be either DD (pure dominant), DR (mixed), or RR (pure recessive). Therefore in mating, the possible series of outcomes would be the following:

DD×RR=All DR
DR×RR=1 DR and 1 RR
DR×DD=1 DD and 1 DR
DR×DR=1 DD, 2 DR, 1 RR
DD×DD=All DD
RR×RR=All RR

Chart II

It might be pointed out that the usual instance encountered in the human family is that of the mating of a DR being with an RR, with offspring resulting half impure dominants, and half recessives for the particular trait or disease.

For instance, a man with red hair (a dominant manifestation which he has inherited from his father, his mother having had dark hair) marries a dark haired woman, with the result that one half of the children have dark hair and one half red hair. Or, to demonstrate, Chart III is of an existing family:

(Owing to the smallness of human families, the expected ratios in hereditary transmission can only be approximated.)

One of the simplest evidences of the operation of the Mendelian laws is the heredity of eye colors. The color of the eye is determined by the deposit of pigment in the iris, and the dark colors are dominant over the grays and blues. Thus, if one makes sure to determine carefully the true eye color it will be found

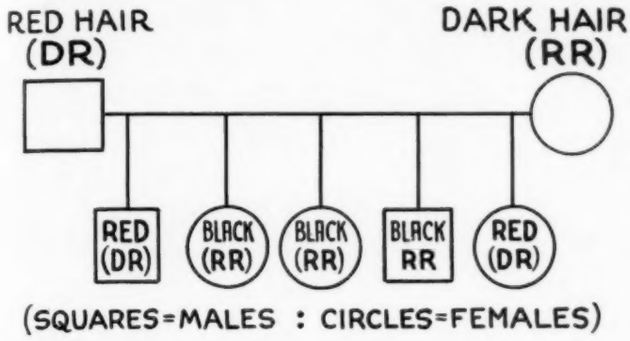


Chart III. If a red haired man marries a dark haired woman, the chances are that one half of the children will have red hair. If a blue or gray eyed man marries a blue or gray eyed woman, none of their children can have brown eyes.

that we have full substantiation of our expectations.

Blue Eyed Parents, Blue Eyed Children

Dark eyed parents, frequently bearing both the factor for dark and for light colored eyes (DR), may have children with eyes of either color (consult Chart II), but blue or gray eyed parents will bear all light eyed offspring, for RR×RR=All RR.

When we come to the heredity of malformations and disease in the human family, we find that the majority of conditions so far investigated appear as dominant to the normal. To begin with a condition which is easily followed because it presents itself to casual observation, it is found that strabismus, or cross eye, is quite regularly transmitted from parents to offspring.

The greatest amount of interest so far has been focused on just such readily observed conditions, and there has grown up a great folio of charts of families where polydactylism (extra fingers or toes), syndactylism (union of fingers or toes), a white lock of hair, the peculiar Hapsburg lip and hare lip have declared themselves through a long ancestral line.

Other malformations and diseases that have showed a distinct tendency to be transmitted as Mendelian dominants include cataract, ptosis (drooping eyelid), glaucoma, night blindness, color blindness, hemophilia, diabetes, pernicious anemia, and one form of chorea.

Of the conditions named in the preceding paragraph, several are designated as sex-limited, indicating that there is a slight departure in their behavior from that expected of ordinary Mendelian dominants.

The most notable conditions falling in this category are perhaps color blindness and hemophilia (bleeders). The outstanding characteristics in such descents are:

1. Males are more often affected than females.
2. Transmission by affected males, but seldom by unaffected males.
3. Transmission by unaffected females.

The probable explanation of this peculiar variation is revealed in an observation made in the breeding of sheep. In these animals the occurrence of horns is a dominant character in the male, and recessive in the female.

So, in the sex-limited conditions among humans, if the condition exists in the male it will declare itself, while in the female, if present, it recedes from view. Thus only affected males can transmit, while unaffected females (harboring the factor) may pass it on to their offspring.

When Cousins Marry

Of recessive conditions very little can be said, because, as is evident by reference to Chart II, each of the parents must carry a dose of such characters to make them apparent in the offspring. Therefore, the most likely place to look for such instances would be among the offspring of consanguineous marriages.

In such cases, obviously, both parents may bear the same factor, bequeathed by a common ancestor, which has remained latent within them. Then with the meeting of a spermatozoon and an ovum, each carrying the recessive factor, a being comes into existence which exhibits the hereditary characteristic. For instance, DR×DR=1 DD, 2 DR, and 1 RR (see Chart II), the RR individual exhibiting the recessive trait.

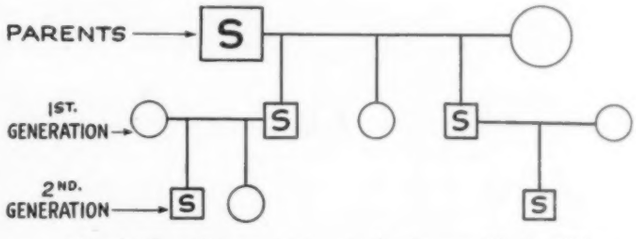


Chart IV. How cross eye is transmitted. The father of this family had cross eye, or strabismus (S), and two of his four children also were born cross-eyed.

The light color of the human eye has already been referred to as an instance of a recessive character, and we can add to this albinism, the occurrence of red hair in some families, probably deaf-mutism, and, possibly, on the basis of some interesting data, the possession of musical sense.

Diseases That Are Inherited as Recessives

Among diseases, mention can be made of amaurotic family idiocy, feeble-mindedness

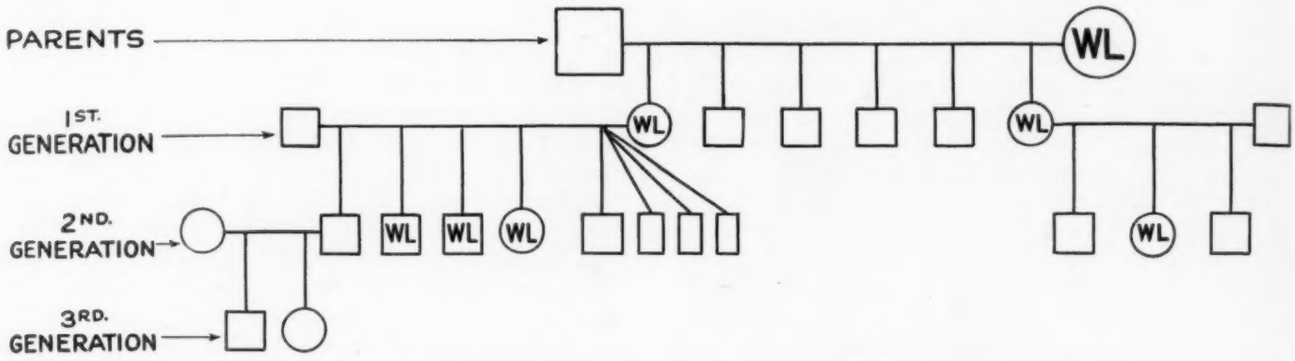


Chart V. A white lock of hair is hereditary. Here is a chart showing how the white lock, a dominant characteristic of the mother, cropped out in succeeding generations.

and retinitis pigmentosa. The difficulty in collecting evidence is obvious, but time and interest will undoubtedly add to the list.

But today a wider significance is associating itself with the matter, on the basis that the question of resistance to disease, dependent on infection by bacteria, may very well be an inheritable trait which is determinable by a study of the family tree.

One can easily call to mind families in which pneumonia or appendicitis seems to occur with fair regularity from time to time, and then other families that never seem to be thus afflicted; some in which susceptibility to tuberculosis or typhoid fever is marked, and other families, again, seemingly immune. Such observations widen tremendously the potential value of studies in this somewhat neglected field of human heredity.

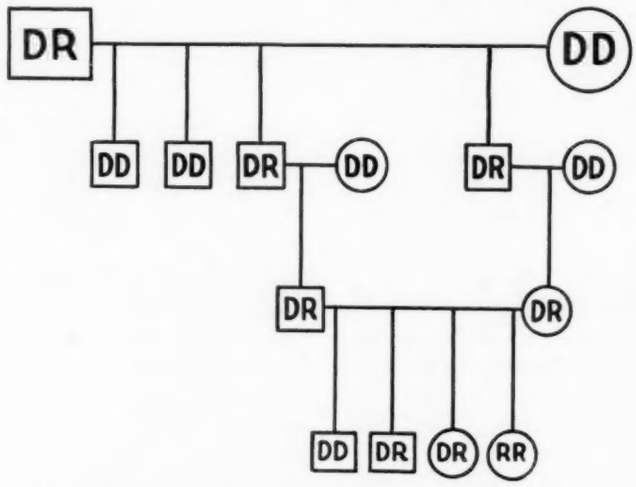


Chart VI. Among European royalty, there has been much intermarriage. In this case a prince, in good physical and mental health, married his first cousin, also seemingly normal.

From a common ancestor, however, their royal highnesses had been bequeathed the same factor of amaurotic family idiocy, which remained latent within them. One of their four children (RR) is an idiot.

Perhaps a little incident from every day life will point very strongly the practical importance of the subject.

One night, after a discussion of the subject at a medical society, an obstetrician approached the writer and put the following case: he had been consulted by a young couple, both afflicted with congenital cataract. They wanted to have a child, but feared that there existed the liklihood that their offspring might inherit their defect, in which case they were unwilling to take the chance. The obstetrician, with humane kindness, laughed off their fears and assured them there was no danger of such a thing. Tonight, he said, some doubt had crept into his mind.

But, unfortunately, it was too late! Nothing could be done.

Care of the Hair

HERMAN GOODMAN

MOST of us come into the world with all promise of a good crop of hair. Indeed, mothers know that some babies are covered almost all over with hair, but this white baby hair does not stay with us long. We shed most of it and, all too soon, some of us shed all of it.

One of the places where we would like to retain the hair with which we were first endowed is the scalp. How much of the ordinary head is considered scalp? This area has been estimated as about 120 square inches, or the area of a book 10 inches by 12 inches, approximately the size of a metropolitan telephone book cover. This, of course, is the scalp of the grown person.

100,000 Hairs on Average Scalp

As to the number of hairs on the scalp, if one is in the full bloom of his hairy scalp, it would be about one hundred thousand.

With that complement of hair to begin with, why do some of us retain some or most of it, and others of us, including you and me, lose a greater part of it?

In adults, there are two reasons why the hair of the head takes wings; that is, two big classes of reasons. One of these classes belong to no class at all, for in technical language this group is called idiopathic. Idiopathic means without any preceding disease, or arising primarily without apparent cause. Naturally the second big group is the opposite of idiopathic, or symptomatic; that is, the loss of hair is a symptom of some other disease, or is secondary to something else.

Now it might just as well be said that the group of idiopathic diseases is always shrinking, as new causes for diseases are discovered. There are two ways of talking about hair that is lost without any apparent cause. One way is to say that the hair is universally lost all over the body; this includes not only the scalp, but the eyebrows, and even the eyelashes.

The other iodiopathic loss of hair is that which occurs in patches. Sometimes the patches are large and confusion with the universal kind may arise. However, in the patchy kind, all the hair from a spot the size of a silver dollar, say, is lost from the scalp or the beard, or smaller patches perhaps from the eyebrows.

The hair is apt to fall out all of a sudden. Very often one goes to bed feeling perfectly well, and with a good crop of hair, and wakes up to find the pillows covered with the hair that the night before adorned the scalp. It is a truly alarming state of affairs. All excited, patients seek the skin specialist's office, and the question they want answered is: Will it come back and how long will it take? Almost always the physician can give a favorable answer to the first question, but to the second, he must be honest enough to disclaim any miraculous powers of prompt restoration.

Now something about loss of hair which is a symptom of disease. Only by proper individual tests can one learn whether the disease is one of the scalp, a local cause for loss of the hair, or whether a general disease is responsible for the hair loss.

It is common knowledge that after all fevers and diseases associated with fevers the hair falls. Indeed, one can foretell when this loss of hair will take place, for it is close to ninety days after the height of the fever. This type of hair loss after general disease, or in the course of general disease, is especially important to remember.

Hair Grows One Inch in Six Weeks

How fast does the hair grow?

Under general conditions, it takes a hair about six weeks to grow one inch. However, not all the hairs of the scalp, even if uncut, would grow to the same length. On the crown and back of the head, the hair may grow 40 to 50 inches and be not unusual, while at the

sides 18 inches is generally the limit. In men, such long hair is very uncommon, and with the fashion, it becomes increasingly unusual among the ladies.

Cutting the hair (table talk to the contrary), does not improve its growing qualities. Interestingly enough, the years when the hairs grow most quickly are those between 35 and 60. In thickness, hair varies from between 150, laid side by side, to the inch, to the finest variety which takes 500 to make the inch.

Contrary to popular conception, there is no hollow tube running the length of the hair, and singeing is only a survival of the mistakes of the past.

One must remember that the hair is continually shedding and regrowing so that one should not get nervous upon finding a hair on the coat collar. Normally, in the healthiest of persons, a hair grows old, is lost, and a new hair takes its place. After washing the hair, one notices a varying number of fallen hairs, but under normal conditions they are replaced. Of course when the number of new hairs runs behind the number of fallen ones, one is on the wrong side of the ledger and should seek competent advice.

The important thing to remember is that the loss of hair may be and usually is contingent on something else, and unless the underlying cause, whether local or distant to the scalp, is properly eradicated it is useless to hope for a new growth of the hair which has been lost or for a cessation of the outfall of the hair still remaining.

This, too, is of importance from the point of view of treatment, for without expert diagnosis, treatment would be unavailing. The treatment of hair is just as much a part of medicine as that of other organs, but for some reason the opinion has sort of crept around that the barber, the drug clerk, or the hair dresser has some sort of secret insight into the problem and one takes their advice with their mixtures, if not with unbounded faith, at least with hope.

Take Care of Hair to Keep It

The care of the hair in health is the insurance against the need for losing hair. One should spend a certain amount of time on the scalp. Keeping the hair and the underlying scalp clean is one of the most important things one can do.

Persons living in the city should wash their hair about once in two weeks, although the hair of those working in places where much dust circulates may require more frequent washing. Those out of doors in the country, of course, need give their hair less attention in this regard.

A good soap, untinted and undyed, is the best in the solid soap, and castile soap can be recommended. The essential of castile soap is that it be made with pure olive oil, and Spanish oil is considered the best. Domestic castile soaps, although a misnomer, may be used if the imported variety is not obtainable.

A good thing to do is to arrange a towel about the forehead and neck so that none of the soapy water and washed out material from the hair and scalp gets the opportunity to fall over the face or body. After a good lather, it is especially important to use plenty of warm water and then still more water to get all the soap out of the hair and scalp, after which the hair should be dried using warm turkish towels and patting it rather than rubbing.

After complete drying, most scalps would be benefited by rubbing with the ends of the fingers, making certain that the nails do not scratch the scalp. A vigorous rub, either dry or with the slightest amount of pure olive oil, will do. Be certain to reach the scalp, parting the hair many times as you rub to expose a line of the scalp each time.

A word now as to the use of a comb and brush.

The Kind of Comb to Use

A wide tooth comb is the only one to use. Select one in which the space between the teeth is oval so that the hair cannot be caught and pulled out or cut off. Most combs unfortunately are not made with this in view and the closed end of the comb presents sharp edges and tight angles.

Your brush for the hair should be only moderately stiff in the bristles, and should be kept scrupulously clean. Give your brush as many washings as you do your scalp.

The wearing of tight hats has been generally thought to influence the growth of the hair in the reverse direction, that is, to stunt its growth. The truth probably is that the conditions requiring the wearing of hat—city life, long hours and little open air exercise—and not the simple factor of the tight hat are to blame.

Indoor existence and the almost continuous use of artificial light must take its toll in loss of hair. Except that one can make use of the modern method of manufacture of artificial sunlight in the ultra light mechanisms, this deficiency is difficult for city folk to overcome. In my own case its use has given splendid results, and I probably owe what hair I have to its use.

Just a final word of advice. If you want opinions regarding your hair and its maintainance on your scalp, go to a physician. Avoid hearsay remedies, self diagnosis and man-of-the-street medicine for your hair, as well as for your health.

How to Cook Vegetables

EVELYN G. HALLIDAY

BY POOR cooking it is possible to ruin utterly the appearance and taste of vegetables and to lose most of their food value as well. Brussels sprouts, for instance, as they are often cooked have a bronze green to brown color, a mushy and shapeless appearance, and a strong disagreeable taste with an odor to match. They are so repulsive, in fact, that few of us care to eat them.

If brussels sprouts are properly cooked, however, they are like a different vegetable. They have a delicate green color, a firm crisp texture, and a mild and pleasant flavor which is relished by the most fastidious taste. Moreover, these properly cooked ones are more than likely to have a higher food value than the others, for oftentimes the process which destroys appearance and flavor destroys nutrients as well.

It should be our aim, of course, to save food value as well as appearance and flavor, and by the intelligent selection of a method of cooking it is usually possible to do so. If, however, we have to sacrifice anything let it be some of the food value, for if the vegetable looks well and tastes well it will be eaten; otherwise it will not.

No amount of talk about the value of vegetables in the diet is going to persuade us to eat them unless we like them, while if we do like them nothing can stop us; even if we had to buy them surreptitiously we should get them and we should eat them.

But before wasting any nutrients we should make sure that we really are conserving appearance or flavor by that means. Often enough we manage to lose most of the food value during the cooking process, but seldom do we save anything by so doing. On the contrary, we usually lose color and flavor in the same proportions as the nutrients. Quite obviously the only way to avoid doing this kind of vegetable cooking is to learn something of the properties of the substances we wish to save, most especially their solubility in hot water and their stability under various cooking conditions.

There are three groups of nutrients in vegetables—vitamins, minerals, and sugar—the solubility and stability of which should be known.

BAKE	STEAM	BOIL (in open kettle)
Irish potatoes	Sweet potatoes	Spinach
Sweet potatoes	Squash	Green peas
Squash	Parsnips	Green beans
	Carrots	Cabbage
	Yellow wax beans	Brussel sprouts
	Beets	Cauliflower
	Spinach *	White turnips
	Green peas *	Yellow turnips (Rutabagas)
	Green beans *	Onions
		Red cabbage †

* May be steamed. They will retain more food value, but will lose a little color.

† Add 1 tablespoon vinegar to each cup of cooking water.

Vitamins. It is generally well known that there are at least three vitamins, designated as A, B, and C, all of which are essential to the growth of the young and to the good health and general well being of individuals of all ages, and that these vitamins are widely distributed in vegetables.

Vitamin B, in fact, has been found in every vegetable tested for its presence; vitamin A in all green and practically all yellow vegetables, also in leafy tissue such as cabbage; and C in green vegetables, in cabbage, in tomatoes, and also to a lesser extent in roots and tubers.

Now every one of these vitamins is water soluble and consequently may be lost to the cooking water, the extent of the loss of course depending on whether or not the vegetable is cooked whole or in pieces and also to some extent on the amount of water used and the time of cooking.

Comparative experiments made on the solubility of vitamin B have shown that it is easily possible to lose over half of this vitamin to the cooking water. It is probable that the other vitamins can be lost in like proportion.

Boiling Destroys Vitamin C

Two of the vitamins, A and B, are fairly stable to heat so that there is very little danger of their loss by destruction in the ordinary cooking process, but the third vitamin C is so sensitive to heat that a large part of it is destroyed by a few minutes' boiling.

For this reason we have not been accustomed to count on getting much of our supply of vitamin C from cooked vegetables. Just recently, however, some attempts have been made to show that a large part of the loss usually attributed to heat is in reality due to the oxygen of the air. If this is true, the loss of this vitamin could be much reduced by cooking vegetables in water which had been previously boiled for a few minutes to expel the air.

All three of the vitamins are very stable in acid. This is shown by the fact that the highly acid juice of tomatoes, even canned tomatoes which have been subjected to a high tempera-

ture in the canning process, are a rich source of all three vitamins, even C, which under ordinary conditions is so readily destroyed by heat. Apparently, then, if we add vinegar to the cooking water of beets and red cabbage to preserve their color we may be helping to preserve the vitamins.

Alkalis, on the other hand, tend to render the vitamins unstable, particularly vitamin C, which appears to be as sensitive to alkali as it is to heat and to air. Ordinary hard water probably contains enough alkali to have an appreciable effect on vitamin C, more especially if the cooking period is unnecessarily prolonged.

Can Lose Half of Iron in Cooking

Minerals. Of all the chemical elements required by the body it has been found that we need to exercise particular care to see that the diet furnishes sufficient iron, calcium, and phosphorus. If we see to it that these are well provided we shall at the same time provide sufficient quantities of the other necessary elements.

Now we depend on our vegetables to furnish us with a large part of all three of these elements, for all vegetables contain appreciable quantities of them. Most particularly, however, do we depend on vegetables for our supply of iron, since certain vegetables, spinach and other green ones in particular, are among our richest sources of this element.

Unfortunately, these minerals are all present in a highly soluble form so that it is possible to lose a very large part of them, over half in fact, to the cooking water.

Sugar. As well as vitamins and mineral salts, many vegetables—among which are carrots, parsnips, beets, and onions—contain appreciable quantities of sugar which, being water soluble, may be lost to the cooking water.

These sugars are unstable in the presence of heat and alkali, even the quantity of alkali in ordinary hard water being sufficient to cause a darkening of the cooking water of vegetables rich in these sugars, if the method used is such as to extract large amounts of the sugar and if the cooking process is prolonged.

Must Keep the Color Attractive

The more of the natural color of a vegetable we can preserve, the greater its attractiveness and appeal to the appetite.

Any one who doubts this statement should take note of his reaction the next time he is served with brownish onions or bronze green spinach.

When we prepare vegetables for children we should be especially careful to keep the color attractive, since the color may be the only difference between a vegetable which is eagerly sought and one which is rejected, or at most, tolerated.

Besides white vegetables, such as onions, turnips, and cauliflower, whose natural whiteness we like to retain, we have the green, the yellow, and the red, the natural colors of which we should be equally anxious to keep.

Now before discussing methods of saving these we must know which are water soluble and which may be destroyed in cooking.

Green vegetables. The green color of vegetables is but little soluble in water, as every one knows who pours off the water after cooking spinach and notices how little green color it contains; hence there is no danger of loss of this pigment to the cooking water. There are, however, possibilities of loss of color through its destruction by heat or acid, for both of these tend to change the vivid green of the fresh vegetable, first to a bronze green and finally to a dirty brown.

Very high temperature, as in a pressure cooker, affects this color change very quickly, while prolonged cooking at the boiling temperature brings it about more slowly. In both cases the change in color is much accelerated by the presence of an acid.

Heat and Acid Destroy Green Color

Now it may be somewhat surprising to most of us to learn that whenever we cook vegetables we have some acid present, even although we do not add any. It has been found, in fact, that vegetables themselves during cooking, particularly during the first few minutes of boiling, give off a small amount of volatile acid.

Whether or not this acid has a chance to act on the green coloring matter depends largely on whether we keep the cooking vessel covered or uncovered; if uncovered, since it is volatile, most of it passes off with the steam and consequently has little effect on the color.

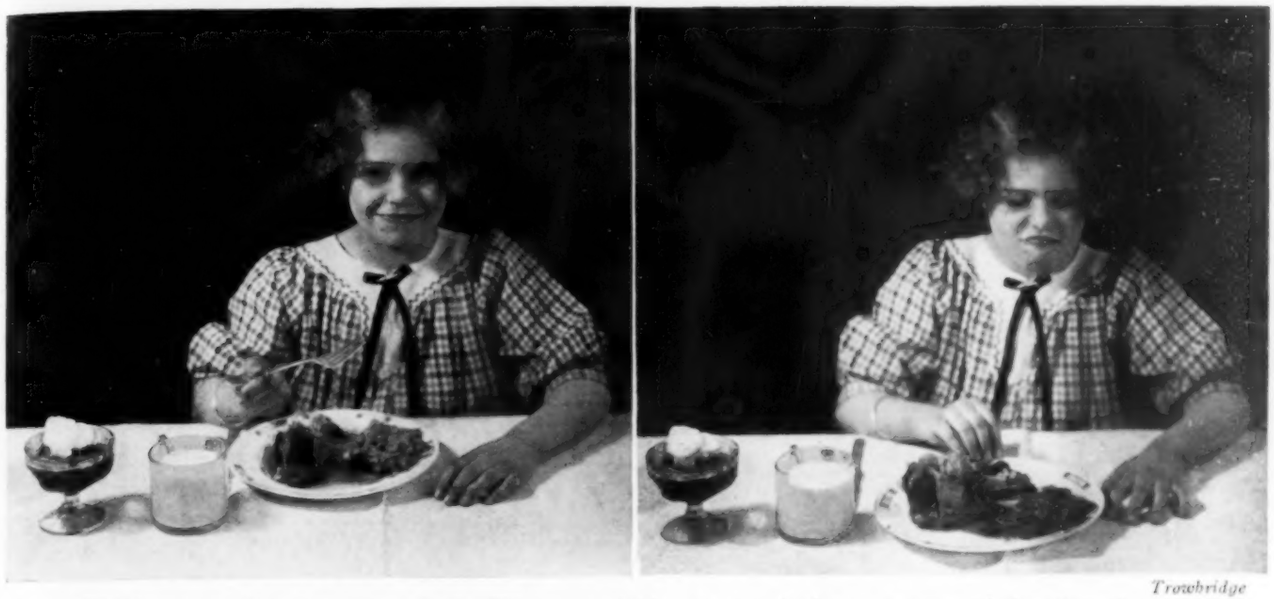
A striking example of the combined effects of heat and acid is the color change which takes place when brussels sprouts are long cooked in a tightly covered vessel. Under such conditions of cooking, as already stated, and as any one may see for himself by trying this method, the attractive green of the raw vegetable changes to an unpleasant bronze green or even brown.

Alkalis Help Retain Green

Heat and acid then tend to destroy the green color of vegetables, but alkalis have just the opposite effect. They intensify it and render it more stable to heat. Ordinary hard water usually contains enough alkali to improve the color somewhat, especially if the volatile acids of the vegetable are allowed to escape by leaving the cooking vessel uncovered.

A very decided intensification of color will be seen, however, if a tiny bit of baking soda, which is a fairly strong alkali, is added to the cooking water of green vegetables.

There are two objections to doing this in practical cooking. One is that, as we have seen,



Trowbridge

Which expression do you prefer? When vegetables are cooked to preserve their attractive appearance and taste, she eats them with a smile. When they are discolored, mushy and with a strong taste, no wonder little girls, and adults as well, turn up their noses.

some of the all important vitamins are destroyed by even a slight excess of alkali; and another is that the careless cook is so apt to add more than necessary to preserve color, enough in fact to disintegrate the vegetable and give it a slimy unpleasant appearance.

To summarize the properties of the green coloring matter, we find that it is not appreciably soluble in water, but that it is unstable toward heat so that long cooking at the boiling temperature tends to destroy the color, and this destruction is hastened by the presence of acid, even the acid evolved by the vegetable itself being sufficient if it comes in contact with the vegetable to help in destroying the color. Alkalis, on the other hand, intensify color, the small amount of alkali in hard water serving to make the color more vivid.

Need Not Worry About Color of Yellow

Yellow vegetables. The yellow pigment of vegetables is but little soluble in water, as we can see by noting the almost colorless cooking water of carrots, even carrots cut in small pieces.

Unlike the green pigment, however, these yellow ones are very stable compounds being unaffected by heat, by acids, and by alkalis. Hence it is that no particular care is required in cooking to preserve this yellow color, but instead, when choosing a method of cooking carrots, squash, and sweet potatoes, we need think only of preserving the food value and flavor.

Alkalis Destroy Red Color in Vegetables

Red vegetables. The red pigment found in beets and red cabbage is so readily soluble that not even the most careless cook would think of cutting them in pieces before cooking.

If the soluble nutrients of vegetables were visible to the naked eye as is the red color of beets we should be as loath to cut up any vegetable before cooking as we are beets. The stability of the red coloring matter is exactly opposite to that of the green, for red is unaffected by heat, intensified by acid, and eventually destroyed by alkalis.

The reaction of the pigment of red cabbage to alkalis is most peculiar and interesting. First it turns blue, then green, and finally, if the pigment and the alkali are left in contact long enough, brown. Thus if red cabbage is cooked in hard water it turns blue, then green, and finally, if cooked long enough, brown.

But the interesting thing is that the original color can be restored by adding a little vinegar; that is, a little acid, unless indeed the vegetable has been so long in contact with the alkali that its color has actually been destroyed, in which case it stays brown and nothing we can do will restore the original red color.

Vinegar Will Restore Color

Beets do not show such striking color changes in alkali, but they do finally become brown and are eventually destroyed if allowed to react with alkali for a long period. This might happen if beets were canned in hard water without the addition of vinegar. Before the stage of destruction is reached the color of beets, like that of red cabbage, can be restored by the addition of vinegar.

The red pigments are then stable toward heat, intensified by acid, and destroyed by alkalis, and methods of cooking designed to prevent their destruction are just the opposite to those designed to preserve the green.

In cooking green vegetables we should like to add a little alkali if we did not fear its

effects on the vitamins, and even the little bit of alkali in hard water is welcome for it helps to intensify and stabilize the color. Moreover, with the green we avoid the presence of acid; even the slight amount evolved by the vegetable is allowed to escape by leaving the cooking vessel uncovered.

Soft Water Best for Red Vegetables

But with the red, all is different. With these we avoid alkali, hence we much prefer soft water to hard; and we favor the presence of acid, hence we must not hesitate to cook in a covered vessel and retain the evolved acids.

In fact, acid is so efficient in conserving the color that we usually add vinegar to the cooking water. This is not absolutely essential in cooking beets for these are cooked whole in their skins and thus protected from the action of the cooking water.

Red cabbage, however, which is exposed to the action of the cooking water is sure to change color unless acid is present. One tablespoonful of vinegar per cup of cooking water is sufficient to preserve color unless the cooking period is overlong.

Avoid Cooking Vegetables Too Long

White vegetables. White vegetables change color for three reasons. Some vegetables which appear white, or nearly so, such as yellow skinned onions, contain a pigment which in small quantities does not give much color unless an alkali is present. Such vegetables become yellow when cooked in hard water, especially if cooked for a long time.

Another color change often observed in onions, turnips, and the like, cooked in hard water can be traced to the sugar which has dissolved out of the vegetable during cooking and has been caramelized by the alkali of hard water. This brown water, especially if cooked down to a small volume, tends to give the vegetable itself a brownish cast.

The most unpleasant color change of all, however, is due to a disintegration of the vegetable itself, the disintegration products of which have a most unpleasant brownish appearance. The conditions which favor this decomposition are long cooking, more especially long cooking in a closed vessel. The vegetables showing the color change are those classed as "strong juiced," such as onions, turnips, cabbage, and cauliflower.

Since yellow skinned onions are subject to all of these color changes, it is no wonder that they are so frequently discolored in cooking.

Vegetables Long Cooked and Cut Up Lose Flavor

Much of the flavoring matter of vegetables appears to be soluble since the cooking water has the same taste as does the vegetables.

Some vegetables have volatile flavoring, hence we get the characteristic odor when the vegetable is cooked. This being so, it follows that long cooked vegetables and especially those cut up and cooked in an excess of water will tend to lose their flavoring and to become flat and tasteless.

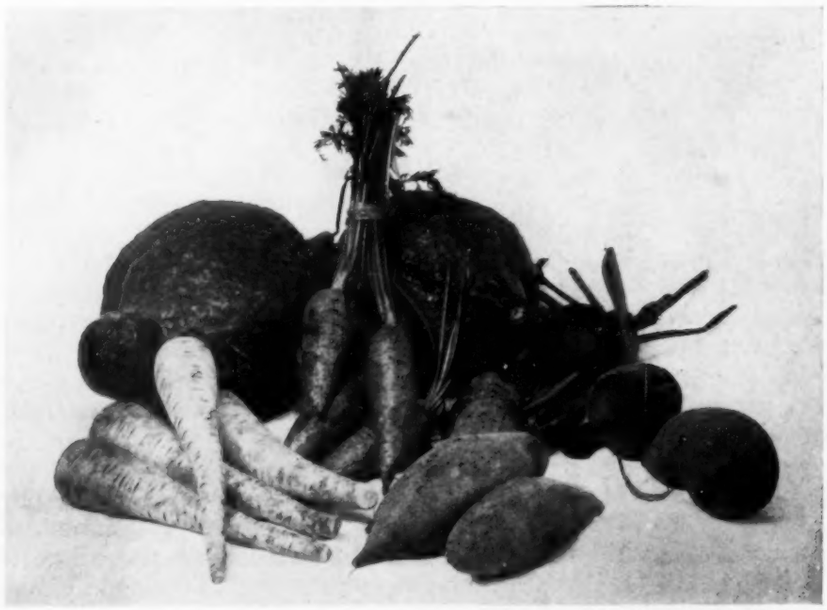
As well as being soluble and volatile, the flavoring of certain vegetables is also unstable toward heat, more especially in the presence of acid.

Chief among the vegetables possessed of these unstable flavorings are the "strong juiced" ones, brussels sprouts, cauliflower, and cabbage. When raw and also when lightly cooked these vegetables have a slightly stinging or biting, but withal a pleasant, taste.

With prolonged cooking, however, the substances which give the characteristic flavor begin to decompose, to give disagreeable products some of which are volatile and tend to pass off with the steam and to fill the house or the apartment — indeed the whole apartment house, including entrance halls — with vile fumes, some of which are even poisonous.

Along with these volatile decomposition products are formed others which are not volatile, hence are retained by the vegetable, and which give it a new and to most of us an intensely disagreeable taste, odor, and color.

To be sure, there are some who profess to like this new flavor, particularly that developed by



Trowbridge

These vegetables are best baked or steamed.

long cooked cabbage, but a taste for almost anything may be acquired if one begins young enough, as witness the German taste for Limburger cheese, the Chinese taste for preserved eggs.

Just what difficulties are encountered by the mother who presides over the process of acquiring these strange tastes it is hard to say; but it is fairly safe to assume that she finds her task no easy one, particularly with the sort of child sometimes described as finicky. It is probably in connection with the long-cooked, strong-juiced vegetables that many of the legends have arisen regarding the child's innate dislike of vegetables.

Trowbridge

Boiling in an open kettle is the best method of cooking these "strong juiced" vegetables.

Overcooking Gives Bad Dietetic Effect

But granted we survive the learning process and come to like these peculiar products, what of their dietetic effect?

When they are cooked in tightly covered vessels not all of the poisonous products pass off in the steam. Some are retained by the vegetable. These together with the offensive non-volatile products are probably the cause of the digestive disturbance which many people complain of after eating such vegetables.

Besides, their food value is invariably low, since the long cooking which develops the strong taste and odor is also the very method which tends to remove soluble nutrients and to destroy vitamins. This vitamin destruction is no small matter, particularly with cabbage, which we will recall has been found to be a good source of all three vitamins, especially of the unstable vitamin C, which is most certainly destroyed by the long period of cooking.

Methods of Cooking Vegetables

The next question is how we are going to choose and adjust our method of cooking vegetables so as to gain the desired end of preserving color and flavor, and at the same time the maximum amount of nutrients.

Baking. There are three general methods of cooking vegetables—baking, steaming, and boiling. Obviously baking—and by baking is meant cooking in the oven without the addition of water—is a superior method since there is no danger of loss through solution of soluble material and no greater danger of the destruction of unstable substances than by any other method.

Unfortunately, the structure of all vegetables is not such as to make baking either desirable or possible. For such vegetables as can be baked successfully, notably potatoes, both sweet and Irish, and squash, this method of cooking is highly to be recommended. The majority of vegetables, however, must either be steamed or boiled in water.

Steaming. If the preservation of nutrients were the only consideration, all vegetables which could not be baked successfully should be steamed, since by this method there is very little loss of soluble material.

Some comparative experiments on losses by this method and by boiling showed that spinach steamed lost but 3 per cent. of its mineral content, while slightly overcooked in an excess amount of water the loss was increased to 67 per cent.

Carrots cut crosswise and steamed were found to lose less than 1 per cent. of their soluble material, while similarly prepared and cooked in boiling water this loss was increased to 56 per cent.

There are a number of steamers on the market which are so constructed as to permit the cooking of several foods at once. These are very convenient utensils, but if they are not available the small old-fashioned steamer which fits over a kettle of hot water can be used instead.

Should Not Steam "Strong Juiced" Ones

As far as food value is concerned, then, it seems that steaming is much to be preferred to boiling. But if we consider also palatability and appearance we shall not cook all vegetables by steaming.

Those most unfavorably affected by this method are the "strong juiced" ones, such as cabbage, cauliflower, and brussels sprouts. When these are cooked by steaming they are discolored and develop the same characteristically unpleasant taste and odor produced by long boiling in water.

This is more pronounced on long steaming, but noticeable even when steamed only until

tender, a stage to which they may be cooked in boiling water without impairing either appearance or flavor.

This difference in the results obtained by the two methods appears to be largely due to the retention in the steamer of volatile acids and other products which in the open kettle pass off with the steam. When these come in contact with the vegetable they seem to favor decomposition to give disagreeable products.

Steaming vs. Boiling

There are two other classes of vegetables about which there is a chance for argument regarding the advisability of cooking in the steamer. These are the green vegetables, such as green beans and peas, which tend to lose their green color by steaming, and the starchy ones, as Irish potatoes, which tend to become somewhat sticky or salvy when cooked by steaming. This change in potatoes is probably caused by the change of some of the starch to another form, the food value of which is as great as that of the original starch, but which has a somewhat sticky consistency.

The change in the color of the green vegetables is undoubtedly due to the effect of the retained vegetable acids. As has been stated, this green color is unstable in acid and tends to become bronze green, then brown in its presence. Hence it is that if green vegetables are long cooked in a steamer they lose their original vivid green and become bronze green, even brown, if the cooking period is sufficiently prolonged.

The effect of time on the loss of color is plainly seen by comparing the color change in spinach and green beans. Spinach, which can be cooked in ten minutes or thereabouts, will retain most of its color while beans which require half an hour or longer always show a considerable color change. To many of us this loss of color may not be of great importance, hence we may choose to steam our green vegetables and save their food value. It is a question of which one is willing to sacrifice, much food value or a little appearance. Each must decide this for herself.

Should Uncover Steamer Once or Twice

If, however, green and "strong juiced" vegetables are cooked in a steamer, it will be found that color and flavor can be somewhat improved by uncovering the steamer and allowing the steam to escape once or twice during the early part of the cooking period. Above all, moreover, one should avoid overcooking.

What has been said about steaming by the ordinary process applies also to steaming in a pressure cooker only to a more pronounced degree. In the pressure cooker more of the steam, and therefore more of the acids are retained. Besides, in the pressure cooker the temperature is higher and this in itself favors change of the green coloring and decomposition of the flavoring of "strong juiced" vegetables.

For certain mild flavored vegetables which are white or nearly so, and not starchy, such for example as parsnips, and also for such as have a pigment which is stable in acid, such as carrots, sweet potatoes, squash, and beets, steaming is unquestionably a highly satisfactory method of cooking.

Carrots Are Better Steamed

There is an added argument in favor of steaming such vegetables as carrots and parsnips which contain appreciable quantities of sugar. In the open kettle method, as already stated, this is sugar dissolved and lost if the cooking water is discarded. It is also more or less caramelized, by the slight amount of alkali in the hard water, and consequently tends to become brown in color. This darkened water tends to give the vegetables an unpleasant appearance, especially if the cooking water is evaporated on the vegetables to avoid loss of nutrient.

A comparison of the appearance of two lots of vegetables, carrots, for example, one cooked by steaming, the other by boiling and evaporating the water so that the loss of nutrients is about the same for each method, is a strong argument in favor of steaming as a method of cooking. The boiled carrots will be somewhat browned and darkened and will have a slightly roughened, wooly looking surface, while the steamed ones will have a clean smooth surface and a most attractive clear yellow color which at once appeals to the appetite.

Steaming, then, is almost as satisfactory a method as baking for cooking sweet potatoes and squash and the very best method for parsnips, carrots, and beets, for it preserves both the food value and appearance. It may also be used to advantage with green vegetables if one is willing to sacrifice a little color for the sake of nutritive value.

Moreover, for those who have acquired a taste for strong flavor in cabbage, brussels sprouts, and the like, steaming is a satisfactory method, for by it one can develop the strong flavor and odor easily and quickly and at the same time preserve food value.

Cook Quickly and in Plenty of Water Boiling.

There remains, then, a discussion of the open kettle method for the strong juiced vegetables if we wish to cook them so that they are mild in flavor and light in color, and also a discussion of the best plan to follow for such other vegetables as we continue to cook by the open kettle method.

To preserve the original color and flavor of the strong juiced vegetables we should cook them in a fairly large amount of water as quickly as possible, in an uncovered dish; then drain and serve at once.

It is most important that the cooking period be as quick as possible, otherwise we might better steam and save more of the nutritive value, for the color and taste of long boiled cabbage is no better than that which has been steamed. It may even be much worse if the boiling period was long, the steaming period short.

The time of cooking cabbage may be somewhat shortened by separating the leaves so that all parts become heated at the same time. Similarly with cauliflower, if the head is separated into pieces it will cook more quickly. Thus prepared cabbage and cauliflower should cook in fifteen minutes or less, instead of the customary period of half an hour or over.

Quick Serving Is Important

Quite as important as short boiling is quick serving. The longer the vegetable is kept hot the more of the strong flavor will be developed, also the more of the vitamins will be destroyed, and if kept in hot water, the more of all the nutrients will be extracted.

It will be found that strong juiced vegetables cooked thus and served at once will not be strong, but mild instead. They will retain the color and most of the flavor of the fresh vegetables and have none of the qualities usually attributed to such vegetables, not even the characteristic odor. By thus making them attractive in appearance and pleasing to the taste they will be eaten in quantities sufficiently large to more than compensate for the loss in food value due to this method of cooking.

And now we come to the question of what can be done to lessen the losses in cooking in the ordinary run of mild flavored vegetables which for one reason or another we continue to cook in the open kettle. There are several things we can do to minimize losses.

We can cook in a small amount of water; we can cook as quickly as possible and serve at once; and in the case of roots and tubers we can cook in the skin, or if we object to doing that, we can at least cook whole instead of cut in pieces. Obviously the loss by solution is proportional to the amount of surface, particularly cut surface, exposed to the water, and consequently a reduction of surface will mean a reduction of losses.

Ways to Save Cooking Water

But whatever precautions we take, some of the soluble material is bound to be dissolved out and lost if the cooking water is discarded.

There are a number of methods advocated for utilizing this water. One is to serve it with the vegetables. This, I think, is equivalent to throwing it away since I doubt if any one ever eats it. Besides, a vegetable served in cooking water is unattractive and necessitates the "bird bath" arrangement of dishes which most of us abominate.

Two other methods are sometimes suggested for saving cooking water. One is to use it for soups and sauces; the other is to evaporate it so that the dissolved nutrients will be absorbed by the cooked vegetables.

Both of these methods are excellent in theory but not so easily put in practice as one might imagine. We do not all make soup every day, hence cannot conveniently utilize the water in this way. Some of us do not care for sauces on vegetables and consequently would not eat them if they were served thus.

Evaporation of the cooking water seems more practical, but there are some objections to doing this. Many vegetables are slightly darkened and discolored by the process; moreover, it is somewhat difficult to do without scorching the product since the time it must be done is the busiest period in meal preparation. But if one can manage it conveniently without scorching or darkening the vegetable it is undoubtedly a good practice; so too is any other method devised for saving nutrients if it does not impair flavor or appearance.

Remember that the important thing is to get the vegetable eaten, and this can best be accomplished by making it look well and taste well.

Trowbridge

Pressure cooker, ordinary steamer and steam cooker—three leaders in the kitchen

Books of Health Interest

Reviewed by HARRY HANSEN AND MORRIS FISHBEIN

WHAT IS MAN? By J. Arthur Thomson, M.A., LL.D. 331 pages. $2. G. P. Putnam's Sons.

MANY a physician who cannot find time to follow the progress of the biological study of man will be grateful to Prof. J. Arthur Thomson for his concise and adequate summary of the whole science in a new book "What Is Man?" Prof. Thomson, it will be recalled, has given much pleasure to the layman with "The Outline of Science," which he edited, and which presents in most readable form a remarkable survey of the evolution of the sciences.

The new book is made up of ten lectures given originally at the University of Aberdeen, where the author is professor of natural history. His book is fit both for the physician and the layman. It tells with clarity exactly what we know of the primitive and prehistoric men, and no more. Prof. Thomson's method is that of being precise and sticking to the accomplished facts; he is willing to suggest what direction speculation takes, but he holds no brief for it; his concern is with the results of the scientist and not with the guesses of the philosopher.

In discussing where man actually came from Prof. Thomson admits the incongruity of our trying to think of man as the center of the universe and at the same time tracing his descent from animals; this contradiction, he says, is always before us. Man is affiliated with the animal world and yet apart—in structure, function and development he must be a divergence from the main line, but when we consider the brain we find the thing that makes man immensely superior to the animal world.

"This fine cerebral cortex, with its 9,200,000,000 nerve-cells," writes Prof. Thomson, "is the protoplasmic correlate of man's true insignia—his capacity for working with general ideas, for language, for strong social sympathies and for self-consciousness of himself, as a personality with a history. . . . It is an error to lay overemphasis on man's apartness and slur over the fact of his solidarity with the rest of creation. But an exaggeration of man's apartness leaves him too much of a puzzle, without affiliation, unaccounted for, like 'a moral Melchisedek.'"

Prof. Thomson discusses the relics of past ages—the pithecanthropus erectus, the Heidelberg, Piltdown, Neanderthal and Cro-Magnon men, and summarizes the verdict of science on man's descent: "What is man's zoological affiliation? A stock common to hominidae and to the higher anthropoid apes. Is any extinct type known which can be regarded as the common ancestor of hominidae and the higher anthropoid apes? The link is still missing."

In logical order Prof. Thomson follows man through the ages; he takes up the origin of marriage and the drift toward monogamy; he traces the evolution of the nervous system and behavior, and of the vertebrate brain; he takes up man in relation to his fellows; the rôle of the unconscious; variations and mutations; the sifting and winnowing; selection by disease and war; sex selection in man; eugenics; the growth of a study of breeding; inbreeding and outbreeding; man's attitude toward disharmonies and disease and the promotion of health.

He speaks of the disparity between the medical profession, which endeavors to save every member of the human race irrespective of condition, and the natural tendency of the race to eliminate its weaker members. "It does not follow that a plague is selective. Mere thinning does not spell progress. What counts is a differential death rate. When a disease is common and more fatal among those with a weak constitution, then there is selection. When a disease attacks more especially those who are careless and thriftless, then there is selection. . . . But the whole tendency of civilization has been to reduce plague and pestilence, and to discover ways of baulking a disease when it gets a grip. Thus the selective death rate must diminish."

Prof. Thomson then discovers the problem of the physician, which is also the dilemma of civilization—the matter of saving weak and useless lives that will not benefit the race, simply because it is the determination of society to save them. We no longer give nature a chance to wipe out unpromising characters. Our whole social sentiment is in favor of saving the diseased, healing the suffering, and in this the physician is engaged, even though he knows that he is saving a man for a useless life.

Says Prof. Thomson: "It is idle to talk about ceasing to try to save so many weakly or defective lives. We cannot reverse the development of social sentiment. We must hold out the saving hand. Moreover, we do not know enough to nip unpromising buds. We cannot contemplate infanticide except in a very few cases, which clearly point to the desirability of euthanasia. Moreover, society cannot disown its debts.

"Yet, can we not reduce the possibilities of multiplication for a century or two? Can we not even reduce the likelihood of adding to the precipitate? Out of the 600 living feeble-minded and epileptic Jukes there were, a few years ago, only three in custodial care."

This is but a meager survey of Prof. Thomson's summary of the whole study of mankind. It is a book that should be extremely readable for men not specialists in this subject. H. H.

WOMAN'S PHYSICAL FREEDOM: By Clelia Duel Mosher, M.D., Associate Professor of Personal Hygiene and Medical Adviser of Women, Stanford University. The Woman's Press. 600 Lexington Avenue, New York.

"THE most sensible brief book of advice for women ever written."

We gladly confer this selling line on Dr. Mosher's book because its study and application to daily life should bring immeasurable comfort and happiness to those women who avail themselves of it.

The book is written in clear, straightforward style. Its author has had an extensive experience in handling the problems of health that occur among young women. Her knowledge is based not only on an apparently thorough familiarity with the scientific literature of the subjects she discusses but also on much personal research.

She preaches the gospel of a free-striding, forward-looking, intelligent individual woman, and she deplores the attitude which makes woman the parasitic, clinging vassal of the dominant male. Nevertheless, her advice will produce no hoarse, strident female caricatures of man but a feminine personality capable of being an equal mate.

The advice of Dr. Mosher is so sound on the subjects she discusses that many paragraphs are worthy of quotation and wide dissemination. Following are a few:

If a corset is worn, it should be worn in such a way that no compression at the waist occurs. No pressure which can make a red line above the crest of the pelvic bones should be permitted. This compression can often be avoided by the use of two or three strings in the corset.

The first step in the physical regeneration of women is to alter their habits of mind in regard to bodily functions. Many women still accept periodic disability as inevitable.

Cure your constipation by the simple and inexpensive methods of a regular hour for evacuation of the bowel, proper diet, sufficient exercise, and abundant water drinking. If this will not accomplish the result, go to a thoroughly trained physician, who will find out the cause of the constipation and try intelligently to remedy the condition.

A good shoe has a straight line on the inner edge of the sole on the great toe side of the foot, a broad, low heel, and a flexible shank. . . . Not only should the woman wear sensible and properly cut shoes, but she should also conserve her feet by walking with the toes straight ahead. The old teaching to toe out at an angle of forty-five degrees has hastened for many women the breaking down of the arches.

By far the largest amount of stress is laid in this book on a proper routine of life to avoid pain and distress during the menstrual period. Dr. Mosher has given explicit instructions, including a system of simple exercises, which have been successful in correcting such disturbances in a large number of young women who have come to her attention.

The title of the book may well be criticized for its ambiguity. Its ninety pages will answer 90 per cent. of the questions of hygiene that are asked by the average woman. The simple title "Personal Hygiene for Women" is suggested as a more direct statement of the material included. M. F.

LOUIS PASTEUR: By S. J. Holmes, Ph.D. Professor of Zoology, University of California. Harcourt Brace & Co.

APPRECIATIONS of Louis Pasteur are not going to be confined to his centenary. The work goes on and it is safe to say that he has been lauded in the last few years in direct proportion to the abuse and neglect he received during the greater part of his life. The newest book to take up the life of Pasteur is "Louis Pasteur," by S. J. Holmes, professor of zoology in the University of California. Prof. Holmes acknowledges his indebtedness to the "life" by Vallery-Radot.

This book is not so much a story for the scientist as for the general reader, for it gives a clear running account of Pasteur's life. The author has taken into account the emotional side of Pasteur's nature and pictured the indecision and anxiety that held him fast during the days preceding and following the first inoculation of a human being for rabies.

There is also here an exposition of the need for trying the preliminary experiments on animals. "Among Pasteur's antagonists there were several people who were opposed to any form of experimentation that involved the infliction of pain upon dumb animals," writes the author. "There are many persons who have the same attitude today. . . . Pasteur employed a few sheep and rabbits in his experiments on anthrax, but he discovered a preventive vaccine for this deadly disease that has saved thousands of sheep and cattle. It required the sacrifice of several rabbits and dogs to discover the cure for hydrophobia. Anyone who had a pet dog given this disease for experimental purposes might be indignant at the investigator. If he had a child who had been saved from a horrible death because of the knowledge gained through the death of the dog, he would probably have a different feeling."

Without going farther into this book, which is principally of value as a résumé of Pasteur's career and is an appreciation, rather than what we understand as a complete "life," there is one comment to which we would like to direct attention. At the great meeting held in honor of Pasteur on his seventieth birthday, Dec. 27, 1892, he gave a word of advice in his address to the young men.

"Young men," he said, "have confidence in that sure and powerful method of which we do not yet know the fundamental secrets.

. . . Live in the serene peace of laboratories and libraries. Say to yourselves, first of all: What have I done for my instruction? and as you go farther: What have I done for my country? until the time comes when you may have the immense happiness of thinking that you have contributed in some way to the progress and to the welfare of humanity."

Do young American men, studying in our laboratories, ever ask themselves: "What have I done for my country?" H. H.

A PLEA FOR MONOGAMY: By Wilfrid Lay. Boni and Liveright. New York. 1923. Price $4.

MR. LAY is, to use an unpermissible pun, a lay psycho-analyst. He has presented in this book a rather undigested mass of material evolved from an unselected reading in the field of sex psychology.

The fact that his authorities have been the works of Dr. H. W. Long and W. F. Robie, none of which has attracted serious medical attention, is significant. Furthermore, from the psychologic side his masters appear to be such writers as Stekel, who have also had but scant attention from specialists in that field.

The purpose of this volume is to instruct the married in the matter of sex, culminating in the usual suggestion for prolongation of the sex emotion. The advice is old, and will perhaps bear repetition, but it is doubtful that much is to be gained by shrouding this simple advice in flowery involved language. It is still more unfortunate that the advice should come from a lay psycho-analytic eroticist whose knowledge of human physiology could stand considerable extension.

From the practical point of view the married couple that is unhappy on the physical side is not likely to seek Mr. Lay's book as a prescription for adjustment. M. F.

To Announce Poster Contest Winners in August

ANNOUNCEMENT of the winners of the 48 prizes in the contest for health posters being conducted by HYGEIA will be made in the August issue.

At the same time there will be announced the names of the 50 whose posters are thought worthy of honorable mention.

Prizes for the posters on health subjects range from $100 to $1, and any high school student in the country is permitted to compete.

Hundreds of inquiries concerning the competition are received daily by the Poster Editor, following the announcement of the prize contest in the March issue of HYGEIA. Complete details of the contest will be furnished to any high school student or teacher of art who failed to see the preliminary announcement, by addressing the Poster Editor, HYGEIA, 535 North Dearborn Street, Chicago.

Judges for the contest are Surgeon General Hugh S. Cumming of the U. S. Public Health Service, John T. McCutcheon, cartoonist of the *Chicago Daily Tribune*, and President William B. Owen of the Chicago Normal College.

The contest for health posters does not close until midnight of May 31, so that high school students have a full two months in which to plan and draw their posters.

The two health posters shown here indicate how a touch of humor may be put into the poster if the artist desires.

These posters are said to have been made by pupils who neither enjoyed nor excelled in art work of any kind, but they contain the striking effect and the simplicity essential in posters.

Winners in the poster contest will not only gain honor and financial reward, but they will have the satisfaction of knowing that their work will be put to use in correcting health habits of the nation.

The Bureau of Health and Public Instruction of the American Medical Association is to utilize the prize-winning posters in spreading the gospel of good health throughout the nation.

Courtesy Child Health Magazine

The Child's Need of Solitude

WILLIAM BYRON FORBUSH

A LITTLE fellow of five recently ran away from home. He was not old enough to have absorbed adventure books and he loved his mother devotedly. He was gone all day, and was found at sunset in a deserted mill, a long distance from town, reluctant to go home.

The boy had brought with him a company of tin soldiers, a pencil, his paint box and some paper. He had spent a large part of the day decorating the interior of the mill with leaves and pine cones, and he had hung outside a wisp of an American flag. Evidently the excursion had been carefully planned, and, except that it was cut off, had been perfectly satisfactory.

"Why did you run away, Junior?"

"Didn't you know how mother would worry?"

"Don't you love mother?"

These were the questions that were hurled at him, as he turned lingering eyes back to his Room of Delight.

"Must Have Place of My Own"

"I do love mother. I knew she would miss me, but"—he suddenly voiced a world-old need of childhood—"I've just got to have a place of my own."

Some of the most profitable hours of a child are when everybody is too busy to be doing him good.

Occasionally to be alone is both healthful and preservative. Children break down in school and girls in college more often from being constantly piled on by other personalities than from overwork. The child has an instinct to feel this, and shows it sometimes by convulsive truancy.

One mother who had the good sense to recognize this need made a Peter Pan house, without any windows or doors, out of a folding screen, and set it up at the sunny end of her own room. Here the child played contentedly for hours, crooning as he played, and only infrequently indicating by conversation a desire for his mother's companionship.

A home of her own

So simple a device as drawing a chalk-line on the floor between two quarreling children, to indicate the boundaries of the territory of each, has proved magical in restoring both peace and poise, as each child has proceeded to busy himself with his own playthings, occasionally watching in silence the inventiveness or ingenuity of the other.

Mother's Room a Refuge

Mother's room is on the whole the best City of Refuge, the domestic confessional, the altar.

On the door of one such room is nailed a tiny replica of the sanctuary-knocker of Durham. The children have been told what "taking sanctuary" used to mean, and they may knock here and enter whenever they desire shelter.

Here at least, nobody is punished. It is the only room in the home that smells of sandalwood. Here mother keeps her "hoards," such unexpected stores of sweets and playthings and treasures. On entrance the child is likely to receive a flower and on departing a drop of scent for his handkerchief. For all who enter here are guests, and there is a decided "company" savor about the whole atmosphere.

In this room the story-telling has a peculiarly precious quality. Mother often relates those soothing reminiscent tales about "when mother was a little girl," and the small daughter is permitted to wear her pearl beads or the big amethyst brooch while mother relates their history.

There are quiet pleasures in this room not found elsewhere. Here the children illuminate texts with red and gold paints out of delightful doll-size porcelain pans; here they sew on the family bedquilt that is going to become an heirloom some day; here they design figures for the family history-rug.

Of course, a mother needs solitude as much as do her children, and there must be hours when even she is not to be burglarized. One mother flies what is known in the household

Some of the most profitable hours of a child are when everybody is too busy to be doing him good.

Every child is entitled to some spot which is free from invasion, where he can play contentedly. He frequently needs relaxation from trying to get along with a world of persons who do not understand him.

as "the fairy flag" when she is ready to receive company, and another, with a sense of humor, uses the weather signals of the department of agriculture in a similar way. A black banner with a white central square, for instance, means, "Storm brooding. Keep away."

To Silence Room When Naughty

A silence room is a wise recourse for moral discipline. It had better be the guest room, because this is usually fitted up in soft colors that suggest rest.

In one such room there is a huge leather chair with wide arms, so placed that in front of it hangs a single picture, a Madonna and Child.

The child whose nerves need rest or who has broken all the commandments within reach is ushered to this chair and asked to stay until a bell is rung for his recall.

As he sits down the mother explains gently but clearly what has been wrong and he is invited to rest and think what ought to be done. The child is not locked into the room, but nobody is allowed near while he is within. He relaxes, and is thoughtful; he may even go to sleep. Almost without exception, he comes out with shining, peaceful face, asking forgiveness for his fault.

Health, of course, is fundamental to morals. Fatigue is the most common occasion of moral ugliness.

We do not appreciate how exhausted a child gets from the constant impingement of other personalities, how his nerves become strained through his endeavors to get along with a world of persons who do not understand him, and do not always try to.

The Whale and the Sea-gudgeon

Just as aseptics give a wound a chance to heal, so the isolation of solitude and silence affords opportunity for moral healing.

One is reminded of the sea-gudgeon, of which Montaigne wrote.

"Whereas all the other things, whether beast or vessel, that enter into the dreadful gulf of the whale's mouth are immediately lost and swallowed up, the sea-gudgeon retires into it in great security and there sleeps."

Solitude is the whale, and the child is the little sea-gudgeon.

"Neighborly Diseases"

II. Diphtheria

GEORGE H. WEAVER

DIPHTHERIA is one of the best understood of human diseases. We know its essential cause, how it operates and the manner of natural recovery. We know how the disease is spread and are able, by a simple test, to determine which persons can contract it if opportunity occurs. We are able by harmless measures to protect the susceptible ones from the disease. If infection has occurred we possess a remedy which, if administered promptly, will bring about a return to former health in practically every case.

In spite of all this, diphtheria continues to be one of the most dreaded diseases and a leading cause of death among children.

Diphtheria is caused by the diphtheria bacillus, which is a microscopic rod-shaped vegetable organism sometimes called a germ. We are familiar with the poisons produced by higher plants, such as opium by the poppy, and belladonna by the deadly nightshade. In a similar manner the diphtheria bacillus when it finds a favorable soil in the body elaborates poisons or toxins, which produce the changes we call disease and which if carried to a certain degree cause death.

The toad stool causes death through the poisons which it contains, the poisonous snake through the toxins which it injects into the animal body, and so the diphtheria bacillus operates through its toxic products. The diphtheria bacillus is as distinct from other forms of bacteria as one form of vegetable is from another.

Germs Grown on Tonsils

When a person contracts diphtheria, the bacilli usually locate on the tonsil, and as they grow there they elaborate their special poison or toxin. This poison first irritates the tonsil and as a result redness, pain and swelling occur.

Because of further injury to the surface of the tonsils there appear white spots, which soon unite to form a larger membrane. This is what has given the name to the disease, the derivation of the word diphtheria indicating a pellicle or skin. This is often spoken of as a pseudo-membrane or false membrane, and as a diphtheritic membrane.

As the bacilli continue to grow beneath this membrane, more toxins are produced and they enter the lymphatics and cause swelling of the neck. They soon enter the blood and are carried to all parts of the body. In this way they reach and damage the heart, kidneys and nervous system. If the injury inflicted on these vital organs is sufficient, death results.

TABLE I

Age	Schick + (susceptible)
Under 3 months	15 per cent.
3-6 months	30
6-12 months	60
1-2 years	60
2-3 years	60
3-5 years	40
5-10 years	35
10-20 years	25
20-40 years	18
Over 40 years	12

Average susceptibility of various ages to diphtheria (as indicated by the positive Schick test) in New York City—Park

How the Disease Begins

Diphtheria usually has an insidious beginning. There is at first a moderate fever, slight general depression with indisposition to play, redness of the throat, and loss of appetite.

At this time the child does not usually complain of a sore throat, and the parents think the child has a cold or is "upset" from some cause. The soreness of the throat is not so marked as in tonsillitis or at the beginning of scarlet fever.

Soon one or both tonsils become enlarged and on the surface there appear whitish spots which quickly enlarge and unite to form a false membrane. This false membrane at first is white and semitransparent, but it rapidly thickens and increases in size by extension at the edges. It soon assumes a yellow or gray or even blackish color.

This membrane soon extends from the tonsil to the adjacent soft palate, covers the uvula, the second tonsil and the back of the throat. From here it often goes upward into the nasopharynx and forward into the nose. With the extension to the nose an irritating purulent discharge from the nostrils appears.

For this spreading three or four days may be required. About this time the process often extends downward into the larynx, making breathing difficult, and from there to the trachea and bronchi, often terminating in

pneumonia. The picture of diphtheria which we have attempted to paint represents the disease as it occurs at the present time when uninfluenced by antitoxic treatment.

Recognize Diphtheria by Cultures

Since diphtheria is always caused by diphtheria bacilli, no case is certainly known to be diphtheria unless their presence is demonstrated. The final test in the diagnosis of diphtheria is the finding of the specific bacillus in the local secretions. Bacilli are usually readily demonstrated by means of cultures.

In making the culture a little of the secretion from the tonsil or elsewhere is collected on a small sterile cotton swab. This is spread over the surface of a special culture medium in a glass test tube or tin box, which is then kept at the temperature of the body for twelve to twenty hours. On the surface of the medium the diphtheria bacilli multiply rapidly and are recognized under the microscope.

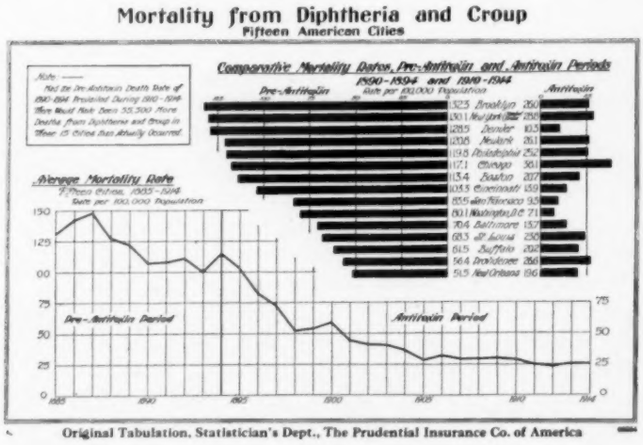
Outfits for cultures are prepared by city and state health departments and are distributed by them to doctors. When the material has been taken by the doctor from the throat or nose and placed by him on the surface of the culture medium, the latter is then spoken of as a culture.

Such cultures are returned to the health department and, after twelve to twenty hours, the doctor is notified as to the presence or absence of diphtheria bacilli. When diphtheria bacilli are found, the culture is spoken of as positive; when not found, as negative. Many commercial laboratories do this work for doctors, and frequently doctors examine their own cultures.

The use of throat and nose cultures has great value. It makes possible the recognition of mild cases of diphtheria which might otherwise pass for tonsillitis, and also the early identification of cases of diphtheria which might be mistaken for other conditions.

The making of cultures from every sore throat at the onset is a desirable procedure. Many cases of diphtheria can be almost certainly recognized without cultures by the appearance of the throat, and every case which has a suspicious appearance should be treated as diphtheria and the administration of antitoxin not delayed.

Mortality from Diphtheria and Croup
Fifteen American Cities



Original Tabulation, Statistician's Dept., The Prudential Insurance Co. of America

Every case of diphtheria has its origin in a preceding case, either directly or indirectly. From the nose or mouth of the person with diphtheria, the bacilli are passed on to other persons. The mode of this passage is variable.

How Diphtheria Is Spread

Sometimes small particles of infective secretion are thrown into the air by the patient in coughing or hawking. These particles may be inhaled by persons near by and lodge in their noses or throats.

More often the infectious secretions are carried by some object from the patient to others. Anything which is contaminated by the secretion of the patient may serve this purpose. Among such objects we may mention clothing, handkerchiefs, pencils, toys, eating utensils and pet animals.

The hands of those who care for the sick may carry the infectious material to themselves and others, and may also contaminate foods and other materials which in turn convey the infection to a third person.

Direct contact by kissing has been the means of transferring diphtheria to many mothers from sick children.

Epidemic outbreaks of diphtheria have been produced by milk which was contaminated by diphtheria bacilli. The milk has usually been contaminated by someone who has recently had the disease or has been about some one with the disease and has become a carrier. An unusual source for the contamination of milk occurred in 1920 at Williamstown, Mass., where a girl who milked cows had an open wound on her finger which contained diphtheria bacilli.

Many Are Carriers of Disease

Persons who are not susceptible to diphtheria may still receive the bacilli into their throats and noses and harbor them for some time, but without any sign of disease. Such persons are spoken of as "diphtheria carriers," and are one means by which diphtheria may be spread. In schools and institutions in which diphtheria is prevalent such carriers are usually present in considerable numbers and are recognized when routine cultures are made from all the pupils.

Persons convalescent or recovered from diphtheria often retain the specific bacilli in their throats or noses for a long time. The "diphtheria carrier" being well and perhaps never having been sick is a fruitful source of innocent spread of diphtheria.

Extensive study by throat cultures has shown that in the general population of cities, from one person in 75 to one person in 1,030

are carriers of virulent diphtheria and potential spreaders of the disease. Of persons who have been associated with active cases of diphtheria about one in 10 becomes a carrier.

Schick Test Tells Who Will Take Disease

It has long been known that certain persons do not contract diphtheria when abundantly exposed. Such persons are said to be immune or not susceptible. Until recently there has been no method of determining whether an individual is susceptible or immune.

This is now possible by a simple, harmless test which was devised by Schick of Vienna, and is known as the "Schick Test." It consists of the injection superficially in the skin of a minute amount of diphtheria toxin. A slight redness follows in the susceptible and none in the immune person. By this test it is possible to determine what persons in a group will have diphtheria if an opportunity occurs and what ones will not.

The use of this test in an extensive way has shown that the number of persons susceptible to diphtheria varies with age. Few infants under six months of age are susceptible and the largest proportion of susceptibles occurs up to five years of age. Table I shows the percentage of susceptibles at various ages.

In New York City large numbers of school children have been given the Schick test. It has been found that in schools attended by the children of more well-to-do parents 50 to 70 per cent. of the children gave positive reactions and were susceptible to diphtheria, while in schools in crowded sections of the city only 16 to 25 per cent. gave positive reactions. In the country districts the percentage of susceptible children is very high.

Antitoxin Used in Treatment

Medical science throughout the civilized world recognizes diphtheria antitoxin as the only essential agent in the treatment of diphtheria.

Diphtheria antitoxin was first used in the treatment of human diphtheria in Berlin in 1891. It came into general use about 1894. It is produced from horses which are given injections of diphtheria toxin in increasing amounts. The horses remain well during the treatment. The serum of the blood of the horse contains the antitoxin, and is secured by drawing blood from a vein.

It is evident that the most important thing in the treatment of diphtheria is the administration of the antidote, diphtheria antitoxin, in sufficient amount at the earliest moment. Damage to the body produced by the toxins before antitoxin is given is not undone by the antitoxin. The extent of this initial injury before sufficient antitoxin has been given determines largely whether the patient will recover promptly or after a long, tedious convalescence. If mortal injury has been inflicted on important structures of the body, such as the heart or nervous system, no amount of antitoxin can prevent death. Deaths multiply with each day the antitoxin treatment is delayed.

TABLE II

Day of Illness	Patients	Deaths	Deaths per 100 Patients
First	329	5	1.52
Second	2,269	77	3.39
Third	2,407	165	6.85
Fourth	1,612	176	10.91
Fifth	911	136	14.92
Sixth	416	54	12.98
Seventh	320	53	16.56
Later	327	50	15.29
Total	8,591	716	8.33

Mortality from diphtheria according to the day of illness antitoxin was given—Ker (Edinburgh)

The Earlier the Treatment the Better

Universal experience shows that the beneficial results from the antitoxin treatment of diphtheria are in direct ratio to the time the remedy is administered in adequate amount. Given the first day of the sickness, practically every patient recovers promptly; given the second day most patients recover; but given still later, a considerable number of patients recover only after a protracted convalescence or they die.

It is important that the amount of antitoxin given shall be enough to neutralize the toxin in the circulation quickly. The experience and judgment of the doctor enable him to estimate the dose suitable to each case. The earlier the patient comes under treatment the smaller the dose. If the subsequent course of events indicates that the initial dose was too small, more should be given after 12 to 20 hours.

No ill effects are known to follow the administration of an excess of antitoxin, and it is safer to give more than may be needed rather than just enough. The dose of antitoxin is measured in units. A moderate dose is from 5 to 10 thousand units, a full dose is from 20 to 30 thousand units. Some patients are benefited by amounts up to 100 thousand units.

A small fire may be extinguished by a pail of water, but when the whole house is burning such a quantity would be useless.

Antitoxin cannot be given by mouth. When it is swallowed it is destroyed and rendered inert by the secretions in the stomach. It must be injected with a hypodermic syringe. Usually the injection is made into the deep muscular structure, but occasionally in very severe cases the serum is injected directly into the vein.

To those who remember the course and treatment of diphtheria in preantitoxin days, the effects of antitoxin are simply marvelous. Then the throat was treated at frequent intervals with swabbings, gargles, and sprays. This was specially harrowing in children who resisted every effort. Most patients with laryngeal diphtheria died in spite of all physicians could do, and many required operations to prevent their dying from suffocation.

Antitoxin Gives Prompt Relief

Now a few hours after antitoxin is given the aspect of the patient is entirely changed, and this with no local treatment at all. The swelling of the neck and throat subside, the membrane begins to peel off, color returns to the pasty cheek, the pale lips become red again and the little patient who was struggling for breath a few hours before falls into quiet sleep.

If persons have not received antitoxin early, the complications which follow must receive appropriate treatment.

When obstruction to breathing has reached a severe degree before the effects of the antitoxin have been secured, temporary relief must be afforded by making an opening into the trachea below the larynx or by passing a rigid tube through the larynx from above.

The duration of confinement to bed and the degree of quiet demanded are determined largely from the time when antitoxin has been given. If given early, recovery is rapid and confinement to bed is very brief. If the case has progressed three or four days before efficient treatment by antitoxin has been carried out, the patient must be kept in bed for a longer time. These neglected cases may develop serious kidney and heart complications which demand confinement to bed for several weeks. When heart complications are present, perfect quiet in a recumbent position is imperative, as the exertion of rising or sitting up may prove instantly fatal.

The paralysis which follows diphtheria does not appear until about a month after the illness began, and in severe instance does not reach its extreme development for two months. During this time the weakened muscles must not be used, and if the patient is unable to swallow, food must be given in liquid form through a tube passed through the nose or mouth. Cases of severe paralysis after diphtheria usually terminate in recovery, but this is only perfectly accomplished after weeks and months of tedious convalescence.

Prevention of Diphtheria

Efforts to prevent diphtheria may take two directions: in one the object is to keep the bacilli from gaining entrance to the body of any susceptible person; in the other the purpose is to render suceptible persons immune so that they will not become sick even if the bacilli reach them.

The object of quarantine of persons with diphtheria and of carriers has for its purpose the prevention of the passage of the diphtheria bacillus to any uninfected persons. That it has failed to accomplish its purpose completely depends largely on the fact that many persons with mild diphtheria and many carriers are never detected. Not being sick, they go about and in ignorance innocently spread the disease.

But while quarantine has not succeeded in eradicating diphtheria, it has doubtless aided in reducing its prevalence, and must be continued. When a member of a family develops diphtheria, other members of the houshold may leave the house if they are free of diphtheria bacilli as determined by cultures.

Fixing the Sick Room for Quarantine

The quarantine measures apply both to the patient and to the one who cares for him. The room chosen should be sunny and have as little connection with the rest of the house as possible. During the period of quarantine no person must enter the room except the attendant and the physician.

Before occupation, rugs, unnecessary furniture and draperies should be removed in order to facilitate cleansing when the illness is over. Eating utensils used by the patient should be removed from the room only after boiling in water. Pieces of gauze or old linen should be used as collectors of discharges from the nose and throat, then placed in a receptacle and burned. Bed linen and towels should be washed only after boiling in water.

Every precaution should be taken to avoid carrying the infection on any objects which have been contaminated by secretions from the patient to other persons. Books and toys must be burned at the termination of the quarantine. The attendant should thoroughly wash the hands with soap and water after waiting on the patient, and should carefully wash the face and hands before eating.

If a hospital for contagious diseases is available, it is wise to remove the patient there if quarantine at home is difficult. It is important to bear in mind that diphtheria is spread through the agency of secretions from the sick, and that these secretions may be carried by any object which becomes contaminated.

Air dissemination plays an insignificant part. The sheet wet with solution of carbolic acid and hung over a door serves only to contaminate the air with fumes of carbolic acid which are irritating to mucous membranes and can hardly serve any useful purpose. Also dishes, containing a solution of chloride, placed about the room are as useful as an ancient charm.

When the patient has had negative cultures for diphtheria bacilli from the throat and nose on three successive days, he may be removed from quarantine. If there should be a discharge from the ear this must also be cultured. The patient is given a thorough bath with soap and warm water, including the hair, removed from the room and given clean clothes. The same procedures apply also to the attendant.

The room and its contents are then cared for. Bedding, clothing worn at the onset of illness, soiled towels, night clothes, and bed linen are boiled and washed. Mattresses and pillows, which have been soiled with secretions and cannot be boiled are best burned. Walls, floors, woodwork and furniture are washed with soap and water. Soiled paper is removed from walls.

Fumigation is not to be relied on and has largely been discarded. The important things are thorough cleansing of all hard surfaces and boiling or burning of other objects. Sunlight and air go far in destroying the diphtheria bacilli.

Mirzaoff

The remedy for diphtheria is diphtheria antitoxin. If the antitoxin is given promptly, the patient is sure to recover. This antitoxin is produced from horses, which are given injections of diphtheria toxin in increasing amounts. The horses remain well during the treatment. Some of their blood is drawn from a vein, and the serum of the blood is the valuable diphtheria antitoxin.

Carriers are quarantined similarly to persons with diphtheria. Because of the absence of much secretion, measures may be somewhat modified and the carriers may be allowed to take exercise in the open air.

How Carriers Are Treated

It sometimes happens that persons who have recovered from diphtheria or who have never been sick, but have had the diphtheria bacilli lodge in the throat or nose, continue to harbor the bacilli for an indefinite time, often several months. These are known as persistent carriers, and they may infect other persons. Such carriers often start epidemic outbreaks in schools.

When the throat is healthy the diphtheria bacilli die out very quickly. In carriers there is usually a chronic discharge from the nose, or diseased adenoids or tonsils. When these local conditions are corrected the bacilli promptly disappear. The removal of tonsils and adenoids in persistent carriers has come to be a recognized method of treatment. This not only rids the throat of diphtheria bacilli, but also removes the menace connected with diseased tonsils and adenoids.

Children May Be Made Immune

The measures so far discussed are instituted to prevent the passage of infectious material from infected persons to others. Other procedures may be used which operate to prevent diphtheria by rendering individuals insusceptible or immune to the disease. Young children who must remain in a house with a patient with diphtheria under circumstances which make perfect isolation difficult or impossible may be given protection for about a month by the injection of a small amount of diphtheria antitoxin.

The general use of vaccination against smallpox has so reduced the occurrence of the disease that one of the former principal causes of sickness and death has become one of the least frequent.

Recently a similar method of vaccination has been found for diphtheria. The process consists in the hypodermic injection of a mixture of diphtheria toxin and antitoxin at intervals of about a week. Of 100 persons susceptible to diphtheria who are given these injections, 80 to 90 become immune within a few weeks. Most of the remaining ones become immune on a repetition of the injections. This process has been used in many places and always with the same satisfactory results.

The most extensive vaccinations have been among school children in New York City. Last year the department of health in New York City reported that among 90,000 children who have been tested and, if susceptible, given the injections, only one fourth as many cases of diphtheria occurred as among an equal number in the same schools who had refused to be tested. Among the former also the cases which occurred were milder than in the latter. In many institutions for children, in which formerly diphtheria caused much sickness, the use of these injections has been followed by almost complete freedom from the disease.

Injections are advised in children as early as possible after six months of age is reached.

They cause almost no discomfort and are followed by no untoward effects. Protection secured in this way lasts several years and often perhaps during life. Children are thus protected against diphtheria during the years in which it is most likely to occur and in which it is most fatal.

When children are over five or six years of age, only those who are susceptible to diphtheria, as determined by the Schick test, should be given the injections. It is important to remember that the protection which follows the injection of diphtheria antitoxin occurs at once, in a few hours, but is transient, only lasting three or four weeks; while the protection which follows the injection of the mixtures of toxin and antitoxin only appear after several weeks or months, but is then permanent. The former can be used to secure protection in instances of immediate danger, the latter as a protection againt infection at some future time.

Few Bad Results from Antitoxin

Diphtheria antitoxin is contained in the serum of the immunized horse, and cannot be separated entirely from other parts of the serum. The antitoxin probably produces no disturbances when injected, but the serum does sometimes cause symptoms. Usually this consists of urticaria or hives which disappear in a day or two. Probably no person with diphtheria has ever died or been permanently injured by antitoxin. A few instances of death have followed the use of small immunizing doses in individuals who were not sick and were subjects of "horse asthma."

When we compare these instances, which can be counted on the fingers of the hands, with the hundreds of thousands of injections which have been given, they appear insignificant. In any of our large cities, as many deaths are produced daily by motor vehicles as have resulted from antitoxic serum in thirty years.

Diphtheria in a single week causes five to ten times as many deaths as has antitoxic serum in thirty years. In the presence of the enormous danger from diphtheria, we may entirely ignore the infinitesimal danger from the serum.

Ways to Avoid Diphtheria

Some of the things which seem important in overcoming the prevalence and destructiveness of diphtheria follow:

1. Examination of the child's throat whenever he is not well.

2. The immediate summoning of a doctor when a child has a sore throat, swelling of the neck, or any croupy condition with hoarseness.

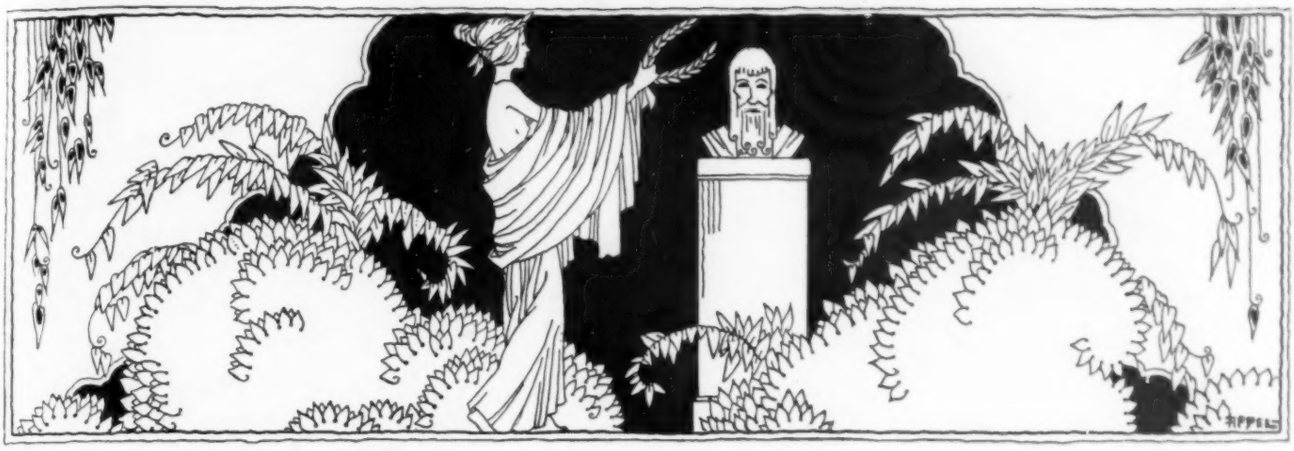
3. The making of culture from the throat at the first visit of the doctor.

4. Administration of antitoxin whenever there is any exudate in the throat, or any condition even remotely resembling diphtheria, without waiting for the results of cultures.

5. Protection by an injection of antitoxin of children who are intimately associated with others who have diphtheria.

6. Immunization of all children over six months of age with toxin-antitoxin. If the first injections are not followed after three months by a negative Schick test, the injections should be repeated.

7. Pasteurization of all milk used by children.



Frozen Antitoxin Scare

WILLIAM H. PARK

IN a suburb of Boston during the cold spell early in February a number of vials of the diphtheria preventive, toxin-antitoxin, were left exposed to a very low temperature for two days. The product when thawed was cloudy in appearance.

Medical officers, having no reason to believe that the freezing had done any harm, utilized it to immunize forty children who had already received a first injection of the same preparation before the freezing, without any annoying results. To their great surprise the injections caused a very considerable amount of local swelling and some general disturbance.

Realizing that the severe freezing had for some unknown reason freed some of the toxin from its union with antitoxin, the director of the state laboratories, Dr. White and the medical officers invited Dr. Schick, Dr. Rosenau, myself and others to see these children.

As a part of the examination, tests were made on animals and they indicated that diphtheria toxin had been liberated from the antitoxin in the frozen fluid. They also showed the amount was too small to be dangerous in the children. This knowledge allowed us to promise the parents that no permanent harm would result. Our prophecy has been proved to be correct, as all the children are now out of danger and all except one of them are now perfectly well.

It happens that several other preparations of toxin-antitoxin are employed in this country and during this same cold spell a number of vials of each of these preparations were frozen and were afterward used. Fortunately there were no harmful effects whatever. These preparations have since been purposely frozen for different intervals of time and no change in toxicity has occurred. Why this special preparation should have shown this change is a riddle which may never be solved.

An important fact in this connection is that in the preparation which is now coming into general use and is to become the standard preparation of this country, the amount of diphtheria toxin is only one tenth of what it was in the Boston preparation.

This new preparation has been tested most thoroughly by freezing and in other ways and has never become in the slightest degree toxic.

In considering what effect, if any, this experience in Massachusetts should have on the use of toxin-antitoxin for immunization against diphtheria, it is important to realize that in the past three years during which the use of toxin-antitoxin has become general that this is the first unfortunate experience that has occurred.

In cities like New York, hundreds of thousands of injections have been given without the slightest accident. An equally important fact is that the amount of diphtheria has greatly diminished in places where it has been actively used. Thus there were in New York City over 1,200 deaths from diphtheria when we began its general use four years ago and last year there were less than 600.

With the adoption of the new preparation and with the added knowledge that has come to laboratory workers in the preparation of the immunizing fluid, there is no probability of the slightest accident happening again. There is every reason, therefore, why we should continue to make every effort through antitoxin and toxin-antitoxin to stamp out diphtheria.

We certainly should not allow this single experience, in which no serious results happened, in any way to lessen our enthusiasm.

Seven Keys to School Health

Part I

CHARLES H. KEENE

IN OUR schools, we are just beginning to carry out the Spencerian ideal of "training for complete living." We must change our health activities in the schools from a narrow, routine physical examination of pupils, from the gladiatorial type of physical education, and from a dry, little-interesting, extraneous physiology, into a living, throbbing part of the daily physical life of every child, and tie up this activity with the life of the community. The real function of the school, then, is training for complete living—for full citizenship.

In health matters, the duty of the school is threefold—protection, correction, prevention—*protection* from the acute and chronic infectious diseases, from the evils of poorly planned, poorly constructed, and poorly administered school buildings, and from the menace of the poorly trained teacher; *correction* of the defects which have arisen because of poor surroundings in the school, home, and community, lack of information on the part of parents and teachers, and as the sequelae of acute infections; *prevention* in the nature of a marked improvement in habits of living, a vigorous upbuilding of physique through proper physical activities properly taught, through proper content and arrangement of the school program, and through the proper planning, construction, and sanitation of the school plant.

School Buildings Need Attention

If this ideal is ever to be attained, it must become a real program of the schools for health, with a very definite content, which may be divided roughly into seven parts:

1. *Hygiene of the school plant.* This includes insistence on provision of proper facilities for heating, ventilating, air moistening, lighting, arrangement of blackboards, clean drinking water distributed in a sanitary manner, sanitary toilets, proper floor area, playground area and equipment, and proper cleaning methods.

2. *Physical education.* A real, vital part of the education of all children is physical education, with activities carried on in classroom, school corridors, playrooms, gymnasiums, swimming pools, playgrounds, and athletic fields.

The content is extensive, covering not only such material as formal exercises, games, and plays, but including such less-known factors as folk dancing and other rhythmic exercises, story plays, song games, and mass athletics.

On the side of athletics, intramural and large group competitions should be emphasized, and interscholastic competition made only an incidental part of the general program. The effort should be to spread athletic activities so that every pupil may have a chance to compete.

Girls Need Part in Athletics

The need for girls to have this opportunity should be particularly emphasized. A considerable part of the efforts toward improving the public health through infant welfare activities is wasted because we begin to care for our babies from ten to twenty-five years too late. The proper and most efficient place and time to begin this care is in the public schools when the potential mothers are elementary school pupils.

Formal gymnastics, whether calisthenics or exercises on apparatus, has a definite place in such a program but, of course, a subordinate one. It should not be the whole or major part of the program. Neither should play and dancing monopolize the field.

One of the means of diagnosing subnormal mentality is the inability of these unfortunates to respond either easily or accurately in exercises given by command.

"Next!" Children need a playground, and one that is properly equipped can become a vital part of a physical education program.

Experienced public school teachers who have specialized in physical education or in classroom work with the subnormal know that these pupils respond to formal exercises only with greater difficulty and after very much longer practice than is the case with normal children. The real truth of the matter is that we should use *all* the factors available in the science of physical education, and not overemphasize any particular phase of it.

School physical education activities also include those of the playground, whether this playground be located at home or school, or whether it be a community, town, or municipal project, and all these should be under the guidance of the board of education.

Removing Pupils' Physical Defects

3. *Health supervision.* Part of the school health program is going through a rapid development and transformation, particularly as student health is seen to be more and more a vital part of the activities of the schools and of the responsibility of school officials.

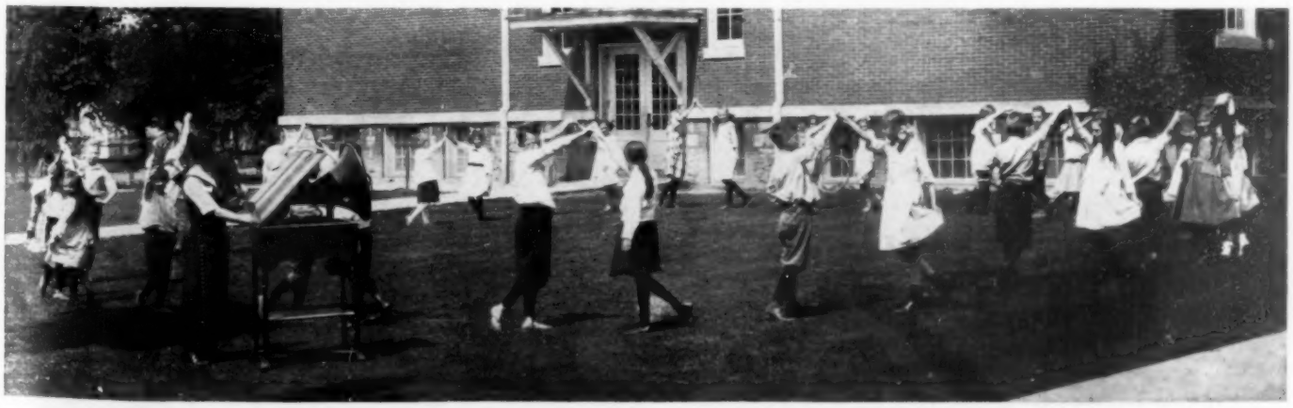
This activity, risen from a primitive medical inspection concerning itself almost entirely with acute infectious diseases to become a physical examination with some corrective activities, now has broadened into a real health examination and inquiry into all of the health factors surrounding the child, with efforts to improve these factors as well as to remove his physical defects. It has become a real health supervision.

Such health supervision should include not only medical inspection, but also a thorough program of guiding and guarding the health of school children through the activities of school physicians, school nurses, dentists, and dental hygienists, reinforced by the establishment of clinics, particularly those for the care of the teeth and the eyes. These clinics should be supplemented by the organization of special classes for the mentally subnormal, for such physically subnormal as those having markedly diminished hearing, extremely poor or progressively deteriorating vision, or crippling orthopedic defects, and for the undernourished.

Open air schools for the restoration of health to those children who are seriously menaced by tuberculosis should be established.

Relief Drills Between Recitation Periods

4. *Hygienic arrangement of the school program.* The school schedule should be arranged to cover not only the number of hours a day that pupils of different ages should attend school, but also the proportion of different kinds of subjects that should be taught and the times of the day at which these may best be taught. There should be proper interspersion of these teaching periods with relief drills and various other physical activities. Consideration should be given the feeding of the child, particularly school hot luncheon at noon.



Children usually enter wholeheartedly into folk dancing and song games.

A parade of Modern Health Crusaders. Every child likes to "dress up," and these knights of the toothbrush and their fellow crusaders are learning health habits and having a good time simultaneously.

5. *Health of the teacher.* Such a reorganization of normal school facilities and program of studies, and such a planning of buildings, arrangement of program, and opportunities for recreation for teachers in service should be instituted as will safeguard the health of the teacher.

6. *Proper training of personnel.* Definite and active steps must be taken in the proper training of a sufficient kind and amount of personnel, not only instructors in physical education and hygiene, but also nurses, physicians and dental hygienists. This will make it possible for local communities to put over a school health program.

7. *Health training and instruction.* We now conceive physiology to be health training and instruction. The goals to be sought here are: to establish health habits and standards, with emphasis on acts rather than on knowledge; to give the child knowledge of practical facts relating to cleanliness and sanitation, to food, fresh air, exercise, rest, and of the causes of preventable diseases with the means of checking them; to develop ideals of health, beauty, and service for self, school, and community that will result in better living; to arouse proper attitudes in the individual of his responsibility for the health of the community, and in the community for the health of the individual, and to set standards of health for the community.

PART II IN THE MAY ISSUE WILL TELL HOW THESE SEVEN KEYS CAN BEST BE UTILIZED.

Treat Your Eyes Right!

E. J. HENRYSON

A WAG contemporary has said, "You can't be optimistic with misty optics." In reading or writing, keep your back to the light, that the light may be on the reading or writing surface, and not on the eyes.

Use ample agreeable light. Glaring lights or dim lights tire the eyes.

Hold the reading matter about fourteen inches from the eyes.

Try to use only books and papers in which the print is large and clear. Small print or blurred print tires and strains the eye.

Your eyes are human. If you tire and strain them, they will tire and strain you.

Rest your eyes frequently.

Your headache, neuralgia, nervousness, indigestion, that dizzy or tired feeling may be warning signs of your eyes.

Near and far sightedness, cross-eye, and astigmatism can often be corrected by properly fitted glasses. You do not get a college education in a kindergarten, nor properly fitted glasses in a ten cent store.

If your doctor advises glasses, get them—and use them.

Never tamper with your eyes. You would not engage a blacksmith to repair your watch. Let your doctor treat your eyes; they are delicate mechanisms. You could buy a new watch, but you cannot see with a glass eye.

Treat your eyes right!

Are You in Business for Your Health?

EMERY R. HAYHURST

EVERY one is in business for his health whether he has ever stopped to figure it out that way or not. We are all intending to do our best as long as possible; it matters not whether it is for ourselves alone, for others, or for the many objectives we are interested in. But we realize that without stamina and health as a basis of procedure we cannot make much progress.

Good health means a great saving to employer and worker alike. The rules to be observed in developing personal efficiency and maintaining or increasing production are food for universal reflection. Thanks to the efforts of many skilled persons who have investigated the whole subject of industrial health from practically all possible angles we now have so-called standards, or tentative codes, for procedure in this field.

Let us first examine the situation as it exists in order to determine the why and wherefore of taking up such a matter as industrial hygiene seriously.

A small group of so-called preventable afflictions cause 43 per cent. of the deaths of all male workers, according to the occupational statistics of the U. S. bureau of census. These include three leaders: tuberculosis, pneumonia, and accidents, totaling approximately 38 per cent., and certain other less common and perhaps even more preventable disabilities, including occupational diseases.

Up to a few years ago (we believe things are somewhat better now), the latest available mortality statistics of the census showed that, with the exception of the farmer, only 13 per cent. of persons in gainful occupations reached the age of 70 years.

Within the past decade great gains have been made in the expectancy of life, that is, in increasing the average duration of life, but analysis shows that nearly all have been in bringing more children and youths up to the age of 21, while in adult life increase in expected longevity has been very slow.

After 40, Chances Not as Good as Fathers'

In fact, after 40 years of age the chances for living as long as our fathers are not considered as good. Stated briefly, more workers reach 40, but fewer reach 50, 69 and 70. Thus the most valuable years are foreshortened.

Old age has come to this man more than twenty years too soon. He is only forty years old.

One gain is outstanding: the reduction in tuberculosis, which up to about ten years ago was our chief cause of death. In front of it have now come heart disease, circulatory diseases, pneumonia, and, in some industrial states, even cancer.

Heart disease alone now claims from one-sixth to one-eighth of all deaths. So far as workers are concerned over half of these deaths occur before the age of 70. Deaths from heart disease are increasing at a slow rate annually. Deaths from heart disease, apoplexy and circulatory diseases are very largely wear out diseases.

Those not due primarily to wear out are traceable very largely to rheumatic, syphilitic and certain other needless infections acquired, as a rule, during the first two or three decades of life.

Omitting cancer, which occurs seven-eighths of the time after 45 years of age, we find that our great group of so-called preventable diseases produces 60 per cent. of its death list before 45 years of age in the case of male workers, and 75 per cent. in the case of female workers.

If we were to consider even a part of the wear out diseases as preventable, and we believe we have every right to do so, and were to add them to the aforementioned group of

preventable diseases, it would be conservative to say that over 50 per cent. of all deaths among occupied persons are uncalled for and, in fact, preventable. This amounts to 250,000 adult lives annually in the United States—a figure approaching the annual quota of immigrants permitted under our present federal law.

We must now add to the above mortality figures, the excessive amount of disability in the living which results in dependency, if not premature death. The age of 40 is so often the age of beginning slump, to be followed by early dependency, that for a half-century or more it has been used by much of the industrial world as the dividing line for hiring and firing, thus cutting a man's productive life in two.

Why So Many Workers Die Early

The causes underlying this waste of human material come under four heads:

1. Individuals are ignorant of their own health and physical status. They know little or nothing as to what a physical examination, such as can now be scientifically made, would show in regard to increasing, maintaining or soon having to end the years of productive work life.

2. While some individuals are only indifferent or careless, most are quite ignorant of the laws of personal hygiene and therefore needlessly reap the consequences.

3. The presence of health hazards in the surroundings, particularly of working places, are generally quite unrecognized or entirely ignored, and, except where constantly supervised, are usually increasing as time and civilization go on. This phase of the question constitutes industrial hygiene.

4. Failure to provide insurance against disability is a fourth cause. The worker has no financial help when once down, and rapid dependency and increased disability follow in a vicious circle.

The cure lies in meeting the four causes just presented. Methods have been carefully studied and reduced to simple laws for guidance, which, on the average, may be stated as follows:

Take First Chance for Physical Exam.

I. *Undergo physical examinations.* Consult a good physician if you have not already made arrangements for a physical examination in connection with your work place, your lodge or your club. Find out how nearly all right you are.

Remember that among civilized races today rarely one person in a hundred is physically perfect. Among adults especially, obesity or underweight often prevails, blood pressure may be too high, heart action weak or irregular, kidneys affected, lungs "touched"—all of these may be without signs which have seemed important to you.

Appearances regarding personal health often mislead. Critical tests, scientifically made, should be the only procedure. Do not accept opinions or trust appearances.

Grasp your first chance for a physical examination. It should be done annually. Put it on the fiscal year basis and have it done on each birthday. Remember that the first physical examination if properly carried out will require some time and will cost more than the price of an ordinary visit to the doctor's office. It will also be worth much more.

15 Rules for Personal Health

II. *Observe the laws of personal health.*

1. Ventilate every room you occupy. Man is not a house animal. Not all is known about Nature's fresh air, but enough is known of its influences to warrant recommending it highly for as many hours of the day as possible.

2. Wear light-weight, loose and porous clothing. Arrange to remove layers of outer garments when the atmosphere becomes too warm. Expose the whole body to an air bath and, if possible, a sunlight bath once daily (as when preparing the toilet in the morning).

3. Get out of doors. Get out without wraps for a few minutes several times a day if possible, for the stimulating effect.

4. When resting for recreation, be sure you are not dissipating by indulging bad habits.

5. Breathe night air at night time. Open your bedroom windows. Have no fires in bedrooms.

6. Breathe deeply—100 times each day—in an outdoor atmosphere.

7. Avoid overeating and overweight.

8. Get back to Nature in the matter of foods which you eat. Remember that Nature's original food products are grains, vegetables, fruits, nuts, meat, milk, eggs and water. Man's elaboration of many of these items results in concentrated food products on the one hand and deficient food products on the other. Some have said that the grocery store is a better place to eat than the dining room.

9. Select your diet from all of the natural food products mentioned in the preceding paragraph; get a certain part fresh every day (i. e., not canned, boxed or bottled); eat the whole slowly and with cheerfulness, leaving your appetite to be your guide provided you eat slowly. Curtail your appetite on man's alterations of foods. Drop fads and foolish notions; chew well and most dyspepsia will disappear.

10. Go to stool regularly and frequently.

11. Stand, sit and walk erect, but relax frequently. While inactive, avoid drafts or cooler air currents against the back, loins and thighs. Keep the feet warm.

12. Do not allow the well-known habit poisons, such as alcoholic drinks, concentrated beverages and foods, or delicacies of all types, to enter the body. Give particular attention to infections, colds and sore throat in the first stages in which they appear.

13. Keep the teeth and gums healthy. Keep them clean. Eat fruits at the end of meals in order to help accomplish this. Clean the teeth before going to bed. See a dentist at least once a year.

14. The secret of great personal power is work, play, rest and sleep in moderation. Never permit a piece of work, or stress or strain of any kind, to run along without frequent interruptions in the nature of relaxations.

15. Keep serene no matter what happens.

III. *Avoid health hazards in your surroundings.* You must, however, know what these are. Here are some of them, particularly as they apply to the daily work:

1. *Bad Air.*—The air in most buildings heated by stoves, furnaces, steam or hot water tends to become stagnant, too hot and too dry, too uniform and too depressing. The result is a loss of tone in the whole body, a lack of the stimulating effects of that fresh air impression. Then come sore throats, colds and many other forms of sickness.

To get circulation of air, use fans, window boards or ventilators. It is undoubtedly better to risk dirty, outside air than "canned" or stagnant indoor air. Guard also against breathing the combustion products of gas heating stoves. These should be vented to the outside always.

Should Reproduce June Air

We should try to reproduce the air of a day in June when we heat the interior for the winter. If it can be done with no greater cost or inconvenience than applies to most of the present systems of heating and ventilating, let us do it.

Put a thermometer in the room as a guide; place it where it will give an average reading after it has been tested out in all four corners or along the four walls and at the center.

Now, if the work in that room is of sedentary nature, try to keep the temperature not over 70° at its maximum. Give more attention to the maximum than to the minimum because workers will complain readily enough if it is not warm enough.

If the work in that room is of semiactive or active character, the room temperature should not mount higher than 65° and 60° respectively.

Remember that it costs in fuel nearly as much to heat a room from 58° to 72° as it does to raise the original temperature to 58° on the average cold day.

On very cold days, let us say from 20° F. down, measures should be taken to humidify the atmosphere of the room. Here is where cost will come in. The installation cost will be very much more than the cost of operation, as a rule, because in the average locality there are relatively few days when the operation of a humidifying apparatus is necessary. From a physiological and health point of view, however, it is so highly necessary on such occasions that it warrants the cost of the original installation.

Controlling Humidity of Air

Depending on the premises, all schemes may be thought of, from pan-and-water devices to elaborate air-conditioning systems. The ventilating engineer should be consulted for larger projects.

As much as 20 gallons of water a day may be needed to moisten properly the air of a six-room house or of a good-sized schoolroom. Few if any pan-and-water schemes will evaporate this amount of water.

Sprinkling a part of the floor space so that evaporation may take place is one scheme. Sprinkling the coal pile or a part of the basement floor in a building which has an opportunity for recirculation of air from floor to floor is another scheme. The use of atomizers attached to the water supply and placed over a sink or drain, or, better still, in the hot-air pipes from the furnace is another. Thus it may be seen that each premise must be studied in order to solve its own problem.

To be able to judge and regulate humidity one should learn the use of either the wet-bulb thermometer or the sling psychrometer. A relative humidity of from 40 per cent. to 60 per cent. is economical and practical of attainment and most healthful. When outdoor temperature is above freezing, artificial humidity is rarely needed. However, on colder days do not be mislead in the belief that humidity may be obtained from the outdoor air.

The beneficial effects of flushing hot, dry interiors by the opening and closing of windows during the day is to be recommended; but it is for the stimulating effect of the sudden cooling influence on the body and not the effect of increasing the humidity in the room that brings about beneficial results.

Stagnant air is practically unknown in nature. Also note that natural air currents are continually changing direction and rate of speed. We should do all we can to simulate this condition in the building, hence the use of fans and ventilators or a combining of the heating and ventilating systems to bring about pulsating circulatory effects of the atmosphere.

Remember that constant variation of temperature, air movement, and (probably) humid-

ity, within reasonable amounts and depending on the state of one's activity, is essential for health.

Try to Avoid Disease Germs

Disease germs are not air-borne, i. e., wind-borne. So-called air-borne diseases are really contracted by approaching closely or coming into contact with persons carrying the germs. Such "carriers" may not themselves be sick and may be entirely ignorant of their own menace.

Avoid touching other people, and things very recently handled by others, as much as possible. Keep beyond the breathing range of moisture droplets which may come from the mouth and nose of others when they cough, laugh or sneeze. Usually quiet breathing gives off no disease germs to the air. Wash the hands often to avoid carrying disease germs or infectious matter to your mouth, nose and eyes.

To avoid crowding, each worker should have an area of at least five feet square in which to work.

2. *Bad Lighting.*—Good illumination means steady light, preferably from over the shoulders. In artificial light, 5 to 10 foot-candles of illumination are needed for ordinary eye work, 5 foot-candles in foundries and similar places and 3 foot-candles on the floors of general workrooms. A foot-candle is the amount of light given by a standard candle one foot away.*

Daylight should be three times stronger than artificial light. Skylight or light reflected from light-colored walls is better than direct sunlight, especially for eye work.

All light should be as near the color of daylight as possible. Sharp contrasts of lights and shadows should be avoided.

Don't face the light for eye work; this causes glare and eyestrain. Arrange work benches sidewise to the source of light. Surfaces of walls should be light-colored to reflect light instead of absorbing it. The source of light should be unobstructed, and light should come from the upper half of windows. Window shades should be used in workshops, offices and schools only on the sunny side, and then only to diffuse sun light, not to obstruct it.

Dirty Windows Are Expensive

Dirty window panes have, by actual test, been found to reduce 10 foot-candles of available light to 2 foot-candles.

Eyes should be protected against brilliant and hot lights by goggles, screens or shades.

Finally, good eyesight is all important. Often the workers' eyes may be defective and need examining. Most headaches are due to eyestrain, and eyestrain may be as fatiguing as the most arduous work.

3. *Poisons.*—Workers with poisons should be properly instructed in their use. The responsibility for such instruction, the courts have decided, rests with the employer.

Many state, labor, and health departments and especially the U. S. Public Health Service are prepared to issue to employers and workmen instructions for the avoidance of industrial poisons of all sorts.

Most poisonings occur because employers and workers both consider the substances dealt with as too innocent to cause much harm. This attitude has unfortunately caused an immense amount of sickness, numerous deaths, and many expensive law suits.

Can't Get Used to Poisons

Practically speaking, all of the poisons used in industry are always poisonous and one can never become used to them. In fact, in this respect, arsenic and phosphorus, being somewhat tonic in their properties, are less hazardous than many of the others which are commonly looked upon with indifference. The maximum amount of any poisonous substance which may be tolerated in the breathing atmosphere or taken into the system in any other manner without causing symptoms of disease is now known, and may be found in most recent textbooks on industrial health, industrial hygiene, or occupational diseases. This maximum amount is often surprisingly small, but it should never be exceeded or disease will result.

The employer must, in addition to providing adequate means of safe use, be responsible for the ignorance and, to a considerable extent, the carelessness of his employees. A foolproof process is an ideal one.

In Ohio, the experience of nearly twelve years shows that the more common industrial poisons arranged about in their order of frequency of use and their likelihood of producing occupational diseases are:

Skin irritants, also cutting oils and compounds
Lead and its compounds
Benzine and benzol—gasoline, naphtha, etc.
Turpentine and similar dryers
Brass or zinc in the form of fumes
Chemicals, such as acids and alkalis
Wood alcohol
Anilin oil
Carbon bisulphide
Antimony
Illuminating and fuel gas
Sulphurated hydrogen
Arsenic
Phosphorus
Mercury

The most common poison, carbon monoxide gas, usually causes an accident (asphyxiation) rather than a disease.

Some Causes of Tired Feeling

4. *Fatigue.*—Fatigue is often the workers' own fault. It is caused by:

(1) Lack of proper diet and of good digestion to get food to muscles and nerves.

* A small portable foot-candle meter manufactured by the National Lamp Works of the General Electric Company is now upon the market for the price of $25, which reads both artificial and daylight illumination. It is especially designed for factory, library and schoolroom purposes.

Because of the smoke nuisance no fresh air is possible within work places in this district of potteries.

(2) Bad air, and especially poor blood or anemia, which keeps an insufficient supply of oxygen at hand in the system to burn the energy out of food.

(3) Weak heart or pump action, delaying food, air and waste materials in transit through the body.

(4) Poor elimination by liver, bowels, skin, lungs and kidneys, permitting poisonous wastes to clog the system.

(5) Wear-out of various organs by disease, often hastened by the use of deadeners and stimulants, such as alcohol, strong coffee and drugs.

(6) Low-grade infections from teeth, tonsils, lungs and bowels.

(7) Certain kinds of work characterized by strain, monotony or rapidity without variation.

Fatigue is also a result of any of the health hazards described in this article.

Natural work promotes a sense of well-being. "I am so tired" should never be heard at the end of a proper day's work. The feelings alone are not trustworthy in determining fatigue. Excessive work may benumb the sense of tiredness, and occasionally one feels tired who is not fatigued.

Too little exercise is a health danger to all animal life.

The best standard for activity appears to be normal output per day, coupled with continuous sound health.

Avoid Extremes of Temperature

5. *Temperature Extremes.*—Exposure to heat produces thermic fever if the temperature goes beyond that of the human body, 98.6° F. Up to this temperature, health, output and everything depends on whether air motion and a dry atmosphere are provided. At temperatures slightly higher than this, prostrations, muscular cramps and anemia are produced. When high temperature is combined with excessive moisture, the effects on health are much worse. For the best work, neither the wet nor dry thermometer should register over 70° F. The comfort zone lies between 63° and 70° F.

The shower bath is an excellent means of controlling the circulation of the blood upon quitting the hot workplace preparatory to going outside.

In almost all trades heat can be controlled or kept away from workmen. Premature old age is a frequent result of continued overheating.

Exposure to cold, pure and simple, is not dangerous to health, provided enough food is eaten, enough clothing is worn, enough exercise is performed and the person is not a weakling. Cooling a part of the body only—except possibly the face—is hazardous.

6. *Dirt and Disordered Surroundings.*—These are dangerous to health because (1) they favor disease, (2) obstruct light, (3) make one less inclined to do high class work, and (4) to observe high standards of health, habits and morals.

7. *Dangers Created by the Natural Desires.*—Under this heading the following should be mentioned:

Thirst must be satisfied with safe drinking water. The desire for stimulants is always abnormal to the healthy person. When present it is usually due to the effects of some of the dangers before cited or to a habit acquired through ignorance or bravado. Stimulants include alcohol, tea, coffee and certain drugs.

Hunger must be satisfied with clean, nourishing food, eaten in a place free from poisons.

Toilets, urinals, sewers and garbage devices must not engender disease.

Sleep must not be disturbed and should last eight hours a night. Make the day the routine of life; don't try to catch up on Sundays only.

Recreation must be recreative, not dissipative.

The necessity and desire to work impel many to work, oblivious of all hazards.

Health Program for an Industry

IV. *Provide for and against sickness.* Inasmuch as the health of civilized man is never certain, not guaranteed, and not self-perpetuating and therefore requires the constant exercise of his intelligence and observation to keep it on the right track, the wise employer will consider his responsibility for group health.

He will not leave everything to the irregular whims and notions of individual employes to look out for themselves. Rather, he will take them into his confidence on the health question, arrange for cooperation with them, as by asking them to appoint a health committee of their own to meet a similar one to be named by himself and the management, the purpose of which shall be the providing of an industrial health service which shall cover the features or health hazards above delineated and shall make arrangements for medical and nursing services, part-time or full-time, depending on the size of the establishment. As a warning, the primary enthusiasm which is apt to possess all concerned in such a plan must be held in check so that overdevelopment of the plan will not follow and later discredit the whole undertaking.

Arrangement should always be made for a close contact with the local health authorities and, in cases of controversial matters, appearance of epidemics, unusual frequency of illness, or puzzling health situations, reference to both state and educational institutions should be included in the scheme of organization.

Insurance Against Sickness

Finally, the direct provision for the occurrence of sickness—the relief scheme—is a most important factor in a proper industrial health program. Just as we have accident insurance to meet the loss due to accidents, so we need insurance protection to meet the financial stress of sickness.

Such insurance should be the real active agent in getting persons to observe the laws of health, to know where they stand through physical examinations and medical advice, to see that they have healthful surroundings and to initiate that much needed measure—a "health first" precept.

Group health insurance is solving much of this problem for employers.

The Man Over 45

MODERN life is too swift; therefore, one of the essential things in the prolongation of life is the cutting down of speed, says the Chicago department of health.

Violent exercise, violent pleasures, violent physical effort of any kind on the middle-aged heart may put it under a too sudden strain with damaging results.

A man over 45 should not run after trains or street cars. If he must hurry, he should start at a walk, increase his pace until he is trotting and then break into a run if he must. He should eat plenty, but not too much; play sufficiently, but not excessively; sleep enough; work hard during working hours, but not when he should be sleeping, playing or eating.

Above all he should not worry. He should eat in a leisurely fashion. Eating in the present day seems to be a lost art. It is too often merely gulping and gorging without due appreciation of the benefit of conversation and harmonious surroundings.

A full eight hours' sleep is required for the normal man to restore his energies completely for the next day's activity. Curtailment of this normal process of nature is in most cases attended by more or less serious consequences, and is most unwise.

Exercise for recreation will fail in its purpose if it is done irregularly or perfunctorily; or it will fail if the individual takes it so seriously that it becomes work instead of play. The man who romps through a game laughing like a small boy derives far more benefit from his play than does the man who concentrates on it in an effort to make himself a champion.

The man with the strongest constitution, other things being equal, will live the longest. The man in normal health does not know that he has a heart, or bowels, or any other organ. Usually a man is 40 years old, or even more, before he begins to think about how long he is going to live.

Before 40 a man is busy and not self-conscious. After 40 a man slackens down a little and begins to think of the future. At the same time, if so inclined, he starts to examine himself and becomes conscious of the inner working of his body.

A man may be only 30 years old, reckoned by the date of his birth, but if his arteries correspond to 50 years, that is his real age.

The Way of the Vegetarian

FRANK THONE

DENSELY crowded peoples invariably and inevitably become largely vegetarian. This is so because the conversion of vegetable tissue into animal flesh is always a wasteful process; the introduction of animals, such as cattle or swine, into the cycle that food must travel from the field to man, sidetracks a great deal of material as spent energy, manure, and offal.

When large populations have only limited means of subsistence, the better economy of the direct field-to-table route forces the adoption of a vegetable regimen, at least to a very large degree. A millenium ago, the inhabitants of northern Europe ate tremendous meals consisting mainly of meat; now the people of the crowded industrial cities of Belgium, France, and Germany usually observe Friday several times a week.

Meat Is Hard to Give up

It is probably true that no race has ever abandoned meat for vegetables with very good grace, and that when it has perforce come to pottage at last, there has still been a great hankering after the fleshpots. There is sufficient natural reason for this.

Aside from the fact that meat tastes good, which is reason enough in itself, it is a highly concentrated form of food. Moreover, the chemistry of digestion and assimilation apparently proceeds more easily when the substances worked on are more or less like the body tissues themselves. It seems to be settled, for example, that bean proteins are less completely taken up by the body than are beef proteins. Similarly, animal fats, though not so easily digested, are much richer in energy than are vegetable starches.

Many Cereals Incomplete Foods

Another reason for variations in nourishment, not yet well understood in spite of all the ink that has been spent in discussion, propaganda, and advertising, perhaps will be found in connection with the obscure substances, minute in quantity but apparently tremendous in importance, that are at present lumped under the head of "vitamins."

Their absence from a diet seems to be responsible for the class of deficiency diseases to which belong scurvy and the great scourge of the Japanese army, beriberi. These substances are conspicuously absent from just those foods that must be the mainstays of a vegetarian diet, the cereals, such as rice and wheat, and other dried, starchy foods.

Arctic explorers used to be in constant dread of scurvy, but in recent expeditions when the meat diet of the Eskimos was adopted, it was found that this danger no longer threatened.

The Rôle of Certain Vegetables

The prejudice in favor of meat is thus apparently well founded, and receives at least some support from science. However, needs must when the devil drives; and populations forced to diminish their meat rations have usually, after a time, managed to adjust themselves, and to work out a diet to compensate for the essential elements lost with the meat.

The ancient Egyptians, or at least the lower classes among them, were vegetarians. The earliest recorded strike occurred during the building of one of the pyramids, when the workmen threw down their tools because they did not get enough leeks and radishes to go with their barley bread.

Use of lettuce as a relish is mentioned in Exodus, although the Hebrews, being shepherds, of course were meat-eaters.

The Greeks in their prime were vegetarians, and indeed came to regard the eating of meat as barbarous and worthy of contempt.

Rome was not so austere, yet it was the Roman legions that originated the daily ration, which survived until modern times in the French army, of a loaf of bread and a measure of wine. And of the use of garlic and kindred plants to temper such a diet, and its persistence even to this day, one's nose can obtain abundant evidence in the course of a stroll in any Latin or Levantine quarter.

Garlic's cousin, the onion, has done valiant service in all fleets and argosies, as a preventive of the scurvy that would have been sure to follow an unrelieved diet of ship's biscuit and salted fat meat, low in vitamins. Able allies are lemons and limes, whence the name "lime-juicer" still flung at every British man-of-war.

The introduction of the potato into general culture in northern Europe occurred at about the time the industrial revolution was making possible the massing of large populations in small areas. The wage and other living conditions made general consumption of meat impossible, and therefore the introduction of the potato was a genuine godsend. The potato is a starchy vegetable, classing with the cereals as a staple food for energy production, but it also has vitamins which they lack when milled.

It is no great exaggeration to say that potatoes are almost as important as coal in the maintenance of an industrial civilization.

The potato could be called Belgian or German with as much justice as it is now called Irish; and a glance at Millet's "Angelus" will show that the occupation of the two French peasants was potato-digging.

If increasing dependence on vegetable food should become necessary on this continent as it has in Europe, it is extremely fortunate that we have such a vegetable to depend on.

The tomato, a first cousin of the potato, and richer in vitamins even if it is of low direct food value, has proved to be a valuable supplementary food in the parts of Europe where potatoes are not much eaten. In the Mediterranean countries, especially in Italy, it finds widespread use, not as a salad vegetable, but dried, as a seasoning. Spaghetti with tomato sauce is a very fair dietetic equivalent for potatoes.

Chinese Are Foremost Vegetarians

The people from whom we can all take lessons in getting along on vegetables is the Chinese. China was as densely populated as it is now when the industrial countries of Europe were the happy hunting-grounds of our barbaric, meat-eating ancestors. The Chinese began their experiments in plant-eating along with the Egyptians, and continued to perfect their system long after the last of the Pharaohs had hardened in his mummy-case.

The Chinese are the most expert vegetarians in the world; in this respect they are at least a thousand years ahead of the rest of us. From one vegetable alone, the soy bean, they make more than fifty dishes, including one that looks and tastes like cheese and another that looks and tastes like milk. I have eaten a dinner made almost altogether from soy beans, proceeding from soy-bean soup to salted soy-bean "nuts" in the most orthodox fashion.

They have a score of pumpkins and squashes, with a series of uses for each, and their array of salad vegetables and "greens" is almost endless. The best of these belong to the mustard family, as do our cabbages. A few of them are finding their way into use in this country; Perhaps the most widely known here is *Pe Tsai,* listed by seedsmen as "Chinese cabbage." It is the salad plants, of course, that compensate for the low meat ration, and relieve the monotony of the rice diet of southern China. Northern China, with a wider variety of grain crops, is better off in this respect.

They Rely Entirely on Native Plants

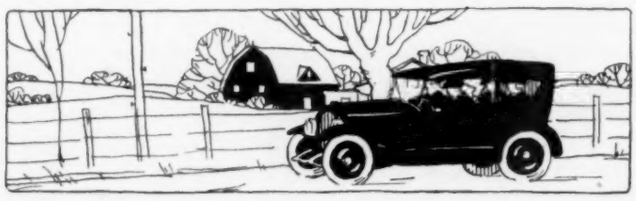
One of the most interesting of recent importations by the Office of Foreign Seed and Plant Introduction of the United States Department of Agriculture is the so-called Genge clover. In reality, this plant is more like a vetch than a clover, belonging, singularly enough, to the same genus as the poisonous loco weed (*Astragalus mollissimus*).

The Chinese gather the tips of the young branches before the beginning of the blossoming season, and use them steamed or boiled. They also preserve them by drying after steaming. These tips command the highest price brought by any Chinese vegetable; especially choice ones sell for as much as twenty-eight cents, American money, the pound.

Why this particular plant should bring such an unheard-of price in China is not known. Probably the Chinese themselves could not explain it, but almost certainly it must have some qualities that make it worth the money. Chinese medicine may be founded largely on superstition, but Chinese eating emphatically is not. Centuries of experience, very practical, if not particularly scientific, have brought out the relative value of each kind of vegetable that goes into the Chinese pot.

Of especial interest is the fact that the Chinese have worked out their food problem by relying almost altogether on native species of plants. Western civilization, from Persia to Peru, has borrowed and imported a great deal; the discovery or development of one people quickly became the property of all. But China in her isolation has made very few importations, and these almost altogether in the dim prehistoric days; the majority of the vegetables on her large menu are strictly home-originated and home-developed.

A record such as this is surely a worthy monument to the patience of her farmers and the foresight and zeal of her early rulers.



The Lady of the Lamp

PLENTY of money, a high place in society, many suitors, good looks, quick wit, talent in writing and in music—in fact, just about everything any girl could desire—belonged to Florence Nightingale at twenty. And yet she was not satisfied.

Her parents had means, and their English country estate was palatial, in the damp and mildewy fashion that English country homes are palatial. Florence was a popular figure in London society and had been introduced at court, which is about all any British society bud could desire. More than that, she had been introduced into Paris society by none other than the famous Madame Recamier.

What is not sure to follow in the case of a social success, Miss Nightingale was learned. Sir Henry de la Beche, who no doubt was "somebody" in his time, declared of her: "A capital young lady that, by Jove, if she hadn't floored me with her Latin and Greek."

But Florence Nightingale had what we today term a "one-track mind." She wanted to be a *nurse,* and that was the one wish her parents would not gratify. Whenever she voiced her desire, she met with all sorts of counter-suggestions—a trip on the continent, study of music under some old master, or marriage with the young Marquis de Blank.

And so Florence Nightingale studied piano and voice; she traveled extensively on the continent of Europe (using much of her time, however, in visiting hospitals); and she followed her parents' wishes in everything except on the subject of marriage. There was no one among her men friends whom she cared to marry, although a number of them were most insistent.

Underwood & Underwood

Florence Nightingale, known as "The Lady of the Lamp" and the "Angel of the Crimea," seated on a piazza in Scutari; beyond the Straits in the distance lies Constantinople.

When Miss Nightingale was 31, her parents in despair over her failure to marry gave their consent for her to enter the Protestant Deaconess Institute at Kaiserwerth in Germany to study nursing.

"I doubt if you will be content to remain here," said the manager of the Kaiserwerth Institute to the well-dressed and cultured young applicant for training. "Our nurses not only nurse, but must scrub floors and do other disagreeable manual tasks."

"Just try me," said Florence Nightingale. And so for several months she nursed and scrubbed floors and studied German hospital methods.

Later she came back to England as executive of a private nursing home in London, where she proved her unusual executive ability. When an epidemic of cholera broke out, she volunteered her services to the Middlesex Hospital and served there.

By this time, the name of Florence Nightingale was known far and wide for her nursing aspirations and her gifts of organization and command, for the field of nursing heretofore had been entered on only by women who renounced the world and joined a religious order or sisterhood.

In 1854 the Crimean War broke out and found Russia fighting against the combined forces of England, France and Turkey. Russia and France both had their Sisters of Mercy to care for the wounded in battle, but England had no nurses. Sir Sidney Herbert, secretary of war, turned to Miss Nightingale as the only woman fit to be put in charge of this venturous undertaking.

Thereupon Florence Nightingale, with a staff of forty nurses gleaned from various sisterhoods, set out for the East on the mission that was to revolutionize army nursing service and to make her name world famous and immortal. Horrible

conditions greeted Miss Nightingale's party when it landed at Scutari on November 4, 1854. She and her nurses were assigned to Barrack Hospital, designed to accommodate 1,700 patients, but crowded with between 3,000 and 4,000 wounded and diseased soldiers.

Beds stretched for four miles, only eighteen inches apart. Vermin swarmed. There were no sanitary facilities, no laundry, no supplies, no food fit for sick men. From 50 to 60 per cent. of all those who entered the hospital died.

Wounded soldiers lay on beds of straw, in their blood-soaked and filthy uniforms. There were no soap, no towels, no basins. An official report showed that only six shirts had been washed within a month. One of Miss Nightingale's first requisitions was for 200 scrubbing brushes.

Revolutionizes Crimean Hospitals

Miss Nightingale set about her gigantic task with dispatch. She instituted sanitary measures, such as had never been heard of before; she established diet kitchens where the right kind of food could be prepared for the sick; she organized hospitals throughout the whole of the Crimea and had 200 nurses under her control. She established recreation rooms and convalescent camps for the soldiers; she saw that their families were systematically cared for; she started a post-office and saving funds for the men. All of these things were pioneer moves and were afterward taken over by the war department.

In the accomplishment of these things, she overcame every obstacle—red tape, official jealousy, the handicaps of government service.

As a result the death rate of soldiers dropped from between 50 and 60 per cent. to 2 per cent., a thing not known of in the army in peace times.

Soldiers "Kiss Her Shadow"

The soldiers loved her, adored her as a deity. It was her personal service in the wards at night which earned her the title of "The Lady of the Lamp," a title perpetuated by Longfellow in his poem "Santa Filomena."

"What a comfort it was to see her pass!" wrote one soldier in his letter home. "She would speak to one, and nod and smile to another. She could not do it to all, you know, for we lay there by hundreds, but we could kiss her shadow as it fell and lay our heads on the pillow again content. Before she came there, there was such cursing and swearing, but after that it was holy as a church!"

While she was in Crimea, a movement sprang up in England to honor her and the Nightingale fund of $200,000 was raised to establish a training school for nurses at St. Thomas' Hospital, where her new ideas in nursing could be carried out. Miss Nightingale herself was to be in charge of the school, but overwork in Crimea broke down her health so that this was impossible. However, she did direct all the policies of the school.

From this first modern nurses' training school came the pioneer heads of training schools all over the world—United States, Canada, Scotland, Australia, and even Germany.

It was through Miss Nightingale's influence and example that the Red Cross Society, now international in scope, was founded.

Kadel & Herbert

The Nightingale home near Ramsey, England. Not far from her home lies the body of Florence Nightingale, which could have been buried with all honors among the immortals in Westminster Abbey.

Water Treatment after Infantile Paralysis

MARGARET POPE

[NOTE: New methods of treatment have an unusual appeal both to physician and patient. In the following article Miss Margaret Pope, one of the first patients with infantile paralysis to be treated by muscle exercise in warm water, gives her impressions of the method. The treatment is to be investigated scientifically in several institutions. No doubt the near future will yield a scientific estimate of its actual value as shown by trial in a large number of cases.—ED.]

IF THE words "infantile paralysis" are but mentioned, it is enough to send the cold shivers chasing up and down the spines of many of us. No doubt the disease has deserved its dread reputation, for until recently little has been known about the disease itself and less about its treatment. Its hopelessness is just now being superseded by a more confident viewpoint.

I am a lay patient who has known the distress of a possible life-long invalidism. My case was an extremely severe one which left me paralyzed from my neck to my toes. After two years I am getting about confidently with crutches, which, in time, I may also discard.

From My Own Experience

On the basis of my own experience and study, I am going to try to show wherein infantile paralysis is and is not hopeless.

It has been discovered that infantile paralysis is a contagious disease caused by a microbe which will pass through a porcelain filter, and which is too small to be seen by an ordinary microscope. Sometimes it appears in great epidemics but often times it occurs in isolated cases and no one knows how the unfortunate victim contracts the disease. It is probable that many people have the germs in their nose or mouth, and possess only symptoms of a cold because the organisms cannot get through into their brain or spinal cord.

How the Damage Is Done

When the germs do get into the spinal cord, they attack the cells in what is known as the anterior horns of the cord. These cells, controlled by cells in the brain, send out the impulses to the muscles of the body and limbs. When they are injured by the invading germs, paralysis occurs. It is as if the battery of a motor car were injured or disconnected so that no sparks could reach the cylinders to explode the gas.

Nature immediately sets up a counter-attack by which to destroy these germs. It does not take her long to accomplish their destruction and so to end the acute stage of the disease. But this battle, unfortunately, has taken place in a very sensitive and important part of the body; if it had occurred in some place other than the spinal cord little damage would have been done. It is peculiar that the inflammation in the spinal cord caused by these organisms affects the central cells much more severely in some places than in others. The degree of paralysis, therefore, depends on just how seriously these cells have been affected.

Like Frost in a Garden

It is as though a frost had swept over a garden; some plants are no more than wilted a little and revive in a few days or weeks (as, in my case, did my arms and back muscles). Other plants are cut down to the ground but come up from the roots the next season (as did my abdominal muscles, left leg and foot and right leg). A few plants may be killed out, root and branch, and never recover (as apparently had my right foot).

Therefore, the patient and his family should not be discouraged but rather should do all that the gardener would to restore his damaged plants. True, the gardener cannot restore what has been killed outright, but he can do much to make conditions favorable for his injured plants. There is no known treatment for the cells in the spinal cord which have been damaged by infantile paralysis. But much can be done to prevent harm coming to the paralyzed limbs and to encourage new muscle power when it begins.

Nature can and must be aided. In many cases while the patient is waiting for nature to do her work in the spinal cord, his more severely paralyzed muscles may become so wasted or overstretched that when a nerve impulse finally does reach them, they are unable to respond. When this is allowed to occur, even though the patient's nerve connections be not entirely destroyed, if the impulses sent out receive no, or very little, response from the stretched or wasted muscles, there is nothing to encourage them to send out stronger impulses.

A great deal of what has been considered my remarkable recovery I attribute to the special care I received from the very beginning of my illness. I was never allowed to remain in one position long at a time; my limbs were supported so that no weak muscles could be stretched, and salt baths and light massage were applied as soon as the soreness had sufficiently disappeared to permit them.

My limbs were not allowed to become stiff from disuse, nor were the influence of gravity

and the pull of muscles not paralyzed allowed to lead to deformity. My feet were held at a right angle by aluminum boots lined with felt, which could be easily put on or taken off by straps. And if my arms had been more severely paralyzed, they would have been put into adjustable splints which permit frequent change of position, and could have been removed to exercise the muscles which they were holding in place. And so when my weak muscles did begin to respond, they had every possible chance. Later, when I began to walk, my weak leg muscles were supported by braces as long as seemed necessary.

Besides the possibilities of stretching weak muscles and of their wasting through long inactivity, there follows the general loss of tone and balance. For these reasons, the physicians say, treatment should begin as soon as the muscle tenderness has sufficiently subsided. Now the question in their minds was: What should be the treatment?

Exercising in Warm Water

My experience along with that of many others, showed that exercising in warm water appears in every way to be an ideal method of preparing the patient for a return of function and of hastening the progress of recovery.

Specialists have for some time advocated swimming and physiotherapy as most effective methods of treatment. Physiotherapy as applied to infantile paralysis is muscle training, along with some light massage. A muscle examination is made and in the exercising one concentrates on the weak muscles. It is scientific and cannot be too highly recommended as a treatment.

But if physiotherapy cannot be had and even when it can be, exercising in the water may be followed as a most valuable accessory to the treatment, or as a parallel treatment. In hydrophysiotherapy the patient has the benefits of the specialized exercises in conjunction with the water, nor is it necessary to have a trained person to supervise them.

The water has many advantages. In the first place it should be warm, say from 84 F. to 96 F. It is known that warmth stimulates and facilitates nerve function. Too cold water is a shock to the nervous system (especially in those recovering from this disease), while at the same time too hot water is enervating.

In the second place it is known that the imminent dangers in treating weak muscles are: first, too little exercise and the consequent atrophy; and second, too much exercise which results in the fatigue of recuperating muscles and in nerve exhaustion.

To reach the balance, skill and care are essential. In making out a set of physiotherapy exercises it takes a great amount of training to know when this balance is reached. Water now plays its second rôle through its buoyancy and resistance, which properties make the overfatiguing of a weak muscle next to impossible.

While the buoyancy of water supports a weak limb, the resistance of water at the same time makes it impossible for an individual with weakened muscles to move faster or further than his actual muscle power will permit. Any voluntary motion made will go toward building up the muscles involved in that motion.

In the water one can regulate for himself the amount of exercise desired in a particular movement. The slower the movement made, just so much less, proportionately, will be the resistance of the water. And, conversely, the faster the movement, the greater will be the resistance. Water, therefore, safeguards the overaction of subnormal muscles.

Helpless Can Often Walk in Water

While water safeguards muscles it also assists in their movement, which is its third function. Its buoyancy supports the long lever of a weak limb and thus makes the accomplishment of greater motion possible. At the same time water greatly lessens the weight of the body, and it is said that when the water is up to the arm pits, more than half of the body weight is relieved. Therefore, a person with weak leg muscles can quite readily stand and even walk in the water, where out of it this would be impossible.

Since to slip or fall in the water could not injure anyone, a greater range of motion is possible; to stand and move and even walk is frequently not difficult, and a return of confidence results. And so water has its fourth advantage in developing the sense and power of balance.

The general health of any one taking exercises in warm water is always improved. He sleeps better, has an increase in appetite, and a lessening of nervous tension. Therefore, the soothing warmth of the water with the increased activity it makes possible results in its fifth benefit, namely, the improvement in general health.

Need Regular Program of Exercises

Any one can splash in the water, but to achieve the best results a scientific program of exercises to fit the individual need should be worked out by the physician. The needy muscles should be concentrated on, and in the most efficient degree. To center on the strong muscles might cause uneven development in the affected parts, and thus tend toward deformities; whereas, scientific movement in the water makes for the even return of muscle power.

It is best to have a muscle examination (by a doctor or a physiotherapist) so as to know just what muscles and sets of muscles should be trained.

Trunk, leg, and arm exercises alike can be worked out for the water. They will differ for each case as no two people are paralyzed in exactly the same way. I worked out the exercises for myself, using to a great extent those I had been doing before on the table, and concentrating on the movements which seemed hardest. My weaker muscles moved more easily in the water than on the table, and so I was able to work them better in the water with the same amount of effort. They responded to this treatment immediately, and increased not only in their arc of motion but also in their strength.

Underwood & Underwood

Infantile paralysis patients have shown remarkable improvement since exercising in this water tank at a medical college dispensary.

By regular effort and hard work muscles will build up. Weak muscles will respond to training just as will an athlete's. Each day without fail (along with physiotherapy), I have gone through my set of exercises in the tank. It has taken me at least thirty minutes to complete them. While in the water I have exerted every bit of energy possible in gaining the best results.

Hydrophysiotherapy, or water treatment, has its practical and far-reaching aspects along with its curative and physiological advantages.

Any thing that will hold water can be put into use. On the farms and in rural districts wide troughs or cistern tanks might be used. A wooden tank four and one-half feet high by six feet in diameter is adequate for all practical purposes. A tank of this type can be installed for approximately sixty-five dollars.

For the past three months, such a tank has been used in an orthopedic clinic.

Similar tanks are in the process of being installed at other places. In all these places statistics are being or will be kept.

Merely operative work on old cases to correct deformities or to prevent deformities will not solve this problem. Nor will physiotherapy alone be the solution, no matter how soon applied. The importance of the after-care and muscle education in cases of this disease cannot be too strongly stressed.

Our Bacterial Neighbors

RALPH A. KINSELLA

THE earth feeds a large family. Not only must the fields and forests be nourished, but the entire brute and human kingdoms must find food for their activities. The entire process involves devious chemical reactions and biologic wonders.

By far the most remarkable feature in this diversified system is the phenomenon of one form of life existing by destroying another. Each form seeks its environment where the proper materials, animate or inanimate, are available. A plant takes simple ingredients, like nitrogen and carbon and water, and compounds for itself the material for its structure and growth. The more highly specialized structure of an animal is obtained, not by utilizing the simple elements which the plant employs, but by seizing upon the already elaborated structures of plants or of other animals.

Man Is the Great Destroyer

In this situation man himself is the great destroyer. Vast crops, immense herds, the birds of the air, the denizens of the deep each year fall before him, to be used for his structure and growth and activity. They are the environment in which he finds materials with which to build and act.

This is the world we see. But what of the world which we do not see, which only the microscope reveals? What of the bacteria? There is no other form of life having so many variations or so many places of abode. Their food is as simple as the environment necessitates. There are bacteria of the air and of the soil. There are bacteria of water. There are bacteria of plants, and there are bacteria peculiar to certain animals and insects, and there are bacteria peculiar to man. Each variety prefers its ancestral environment and is transported to strange fields only by some independent agency. Each has waste products of its own activity, derived not only from its own body but also from the body of its host.

Live Together in Harmony

When bacteria have lived for many years in one place they become satisfied, adapted to the place, and of course this adaptation is mutual with the bacteria and their host. Under such circumstances there is no energetic struggle for existence. It is only in strange surroundings that the struggle is different, and as the food is different so may be the waste products.

The bacillus of tetanus, which normally inhabits the intestines of swine, lives in perfect accord with the intestinal cells and neither the cell nor the bacillus is destroyed. When the excreta of the swine are mixed with the earth, the tetanus bacillus, with great tenacity, clings to its life, but only at the cost of suspending its activities and remaining in the shape of small round bodies called spores. If such spore-bearing dirt contaminates a human wound the tetanus bacillus bounds back into active life. And in the human cells, which, unlike the intestinal cells of its previous host, are not in accord

Underwood & Underwood

One of the most noteworthy triumphs over bacterial neighbors took place in the Panama Canal Zone, when General Gorgas rid that country of the malaria-bearing mosquito. This is a typical scene of native homes, stores and rum shops occupied by Columbian and Negro inhabitants of the Isthmus, and gives an idea of what the Canal Commission had to overcome in order to make the Canal Zone a liveable place.

Underwood & Underwood

A part of the battle against disease in the Panama Canal Zone consisted in the cutting of the rank growth of weeds and marsh grass, which was the breeding place for mosquitoes.

with this new parasite, the products of the tetanus bacillus result in the most disastrous convulsions.

Must Avoid Bad Company

There is strong need for selecting our company among our bacterial neighbors. This is not always possible. What is more feasible is that we may to some extent avoid bad company. The whole scheme of modern sanitation seeks to keep man from association with strange parasites. It is this promiscuous association with undesirable bacterial neighbors that characterizes life in the tropics, if man does not resort to the proper precautions.

By following out such a plan as this General Gorgas separated the human workers in the Canal Zone from association with the malaria-bearing mosquito, and made it possible for man to enjoy life and be effective in building the Panama Canal. We may infer from what has been said that it is really incorrect to speak of bacteria invading the human body. Invasion means a deliberate act. Bacteria have no mechanism by which they may select a human victim. They are carried to a human environment from elsewhere.

Body Tenants Demand Good Accommodations

There are numerous varieties of bacteria in each human body, and wherever man goes, whether to the equator or to the poles, he bears with him this retinue of attendants for whom he constantly maintains a comfortable body heat. But these nearest neighbors of ours are practically harmless. No reaction results from their living in or about the tonsils or gums, intestinal tract, or surface of the body. The body cells that come into contact with these "squatters" are not disturbed.

But if, by virtue of some change in the behavior of these body cells, the bacteria find themselves deprived of their customary accommodations, they may multiply their number in an effort to preserve their corporate existence, and they may be carried into and beyond the neighboring cells. The products of these new activities in the changed surroundings arouse the body into fresh energy and produce a realization on the part of the human body of these strange activities. These processes we are accustomed to call the symptoms of infection.

What "Catching Cold" Means

This mechanism frequently takes place when we expose ourselves to cold. Recently some medical investigators showed that the lining of the throat becomes mildly inflamed when the body is chilled. The experience of "catching cold," which is often really the same as getting an infection in the nose and throat following an exposure to wet and cold, is common to all.

If we merely had to adapt ourselves to the bacteria that live with and on us, a few simple rules of conduct might suffice to obliterate infection. As it is, such rules are important. They have to do with avoiding exposure, and with keeping the cells of the body in their usual state by reasonable food and exercise.

Neither would we have to be particular about our human associates as far as their number is concerned. People in tenements do not suffer from infection by these adaptable bacterial neighbors, no matter how congested the quarters. But we are not now considering the question of filth.

Unfortunately we can become adapted only to our immediate environment. Adaptation

comes from contact. We cannot be adapted to bacteria with which we have never previously come in contact. We must simply meet the situation when it comes. The same rules of conduct, of "keeping fit," will always be of advantage, but the most healthy bodies may find it impossible to live in the presence of totally strange bacteria whose activity, whose feeding on our substance, create chemical substances of destructive and poisonous character, called toxins.

If we can survive this strange distorted activity with its display of pain, fever, and discomfort, we will not be taken by surprise again; we will have adapted ourselves to this neighbor at least for a number of years; and this we usually call immunity.

Spreading an Epidemic

The most important of our bacterial neighbors therefore are those that live some distance from us in normal times. We do not always know their habitat. It is interesting to speculate on the origin of the bacteria that cause strange diseases. These are the epidemic producers. In regard to this variety of bacteria the factor of crowding is important. These bacteria, finding themselves in new surroundings with new, yet satisfactory, food, are stimulated to vigorous growth, and these may be coughed or sneezed into the air. The more persons inhale this air, the more persons will receive the cause of the disease, and the result is what we know as an epidemic. If drinking water is contaminated with such bacteria, the epidemic is spread in that way.

Much interesting speculation was held concerning the mode of transmission of the great epidemic of influenza. Direct transfer by contact between persons, indirect transfer by coughing and sneezing, and even transmission by trade winds were earnestly discussed as the means by which this rapidly moving and deeply penetrating poison was spread.

The extreme rapidity with which influenza spread through populous centers certainly speaks in favor of a capacity to penetrate human cells—to infiltrate—which we could only imagine an extremely minute body would possess.

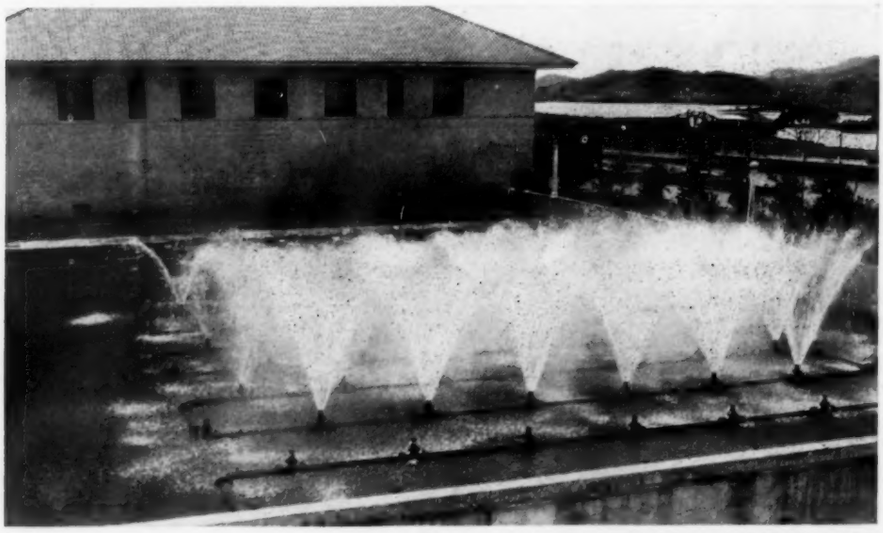
For illustration, we do not expect bodies of the usual size of bacteria to get beyond the barrier of our healthy cells without some "argument at the gate," some time-consuming reaction after which the bacterial body might find an opening. So most investigators expected that the cause of influenza would belong to the family of bacteria that are so extremely minute as to pass through filters.

In this connection the recently announced discovery of the cause of influenza by the Rockefeller Institute is most acceptable, even though the particular *Bacillus pneumocintes* may not be the invariable cause of the great epidemics. The mode of transmission is still unknown.

Where Is the Influenza Germ Now?

No better display of the process of adaptation between human host and bacterial stranger could be found than in the process by which influenza gradually disappeared as an epidemic. The first great epidemic in 1918 found practically the entire population unprepared, unadapted, and unable to adjust itself to this bacterial stranger. Millions died in the process of reacting to its presence. But those who survived were not disturbed by the return of the stranger in 1919, and only those who had not previously been affected were then afflicted with the disease. At the present time only sporadic doubtful cases exist.

We are naturally led to wonder where the germ of influenza is living at the present time, in what animal, in what plant, in what insect. And what will be the special physical conditions which will make its return possible in twenty or thirty years when the human race



Underwood & Underwood

Drinking water for those who live along the Panama Canal is supplied by the Miraflores purification plant, one of the greatest engineering feats of its time. This photo shows the aeration tank, where the water is improved by aerating it with oxygen.

will have lost the immunity or adaptation which it now enjoys?

Keeping Bacteria in Proper Places

In looking over the swarms of bacteria which inhabit the earth in its various departments, we are struck, therefore, by the fact that the least harmful to man are those with which he comes in daily contact, the bacteria of the air and water and the bacteria that inhabit the internal and external coverings of the human body.

To take good care of those coverings, the skin, the mouth, the nose, the throat, the intestines, the genito-urinary tract, is to be reasonably safe from the infectious diseases that result from the entrance into our bodies of such normal inhabitants of the surfaces. This care is, in short, personal hygiene. Contamination of the air or the water or of our body surfaces with strange bacteria, even when no fault in personal hygiene has been committed, may result in such diseases as dysentery, typhoid, scarlet fever, whooping cough, and many other unusual infections.

Must Look to Personal Hygiene

After all, the diseases which cause the greatest amount of human disability are not the acute epidemic diseases, but the chronic diseases that are not contagious. It is a general rule that immunity is more nearly complete after violent infections than after half-hearted invasions. In other words, these strange bacteria cause energetic activity on the part of the body that results in well-defined immunity, and the bacteria themselves leave the body, except in rare instances, when the body becomes technically a "carrier."

But the indolent, ever-present bacteria that frequently cause disease by virtue of some damage to the cells of the body provoke a correspondingly indolent response, and the result is most likely to be a chronic disease.

The attitude of the human race toward its bacterial neighbors, if it takes into consideration the facts described, is based on a certain amount of isolation and a certain amount of democratic adaptation. We desire to avoid unadapted strangers, and on this is based the scheme of so-called preventive medicine so far as it refers to sterilization, isolation, and sanitation; or we desire to become temporarily and artificially adapted to these bacterial strangers, and on this is based the scheme of preventive medicine, so far as it relates to vaccination or treatment with antitoxins. With the intimate every-day bacterial neighbors we desire harmonious agreement between bacteria and a well-kept body.

Thus we see justification in one relation at least for the policy of isolation and the policy of cooperative understanding. As far as we are concerned, we must be impressed by the importance of personal hygiene. We must be supporters of all movements looking to a better sanitation of our communities. We must support the existing health laws which insist on the reporting of contagious diseases and on their isolation. If we have the means at our disposal we should endow research on particular problems.

Should Vaccinate against Strange Bacteria

Vaccination is an interesting subject. The object of vaccination is to present the cells of the body with the problem of reacting to strange bacteria or poisons. Pasteur discovered that once the body faces the situation of new bacterial neighbors, it adapts itself in such a way that subsequent visits from these bacteria find the body prepared and impervious to the poisons of the infection.

From the distinction we have made between the mechanism of acute contagious invasions

Underwood & Underwood

The Miraflores purification plant has a capacity of 15,000,000 gallons of water a day.

of the body and the chronic infections, it is clear that the greatest success will be obtained by vaccination against the epidemic diseases rather than against the chronic infections. The body will not react as energetically to its old neighbors as to strangers. Vaccines made of the usual bacteria found in the human body have little immunizing power, while those made from the virus of smallpox or typhoid bacilli already have established their value.

Underwood & Underwood

Another view of the great Miraflores purification plant. This plant is largely responsible for the transformation of one of the most deadly malaria breeding spots in the world to one of the cleanliest residential areas.

Deceptive statements alleging the uselessness of smallpox vaccination are occasionally made by persons who do not believe in the existence of bacteria. We should resist the attacks of such benighted persons on our safety and the safety of our children.

Finally, we should as citizens concern ourselves with intelligent health legislation. We should demand of those who assume to treat persons with infectious diseases that they inform themselves of the existence of bacteria and study and apply the means by which the human body may protect itself.

Bacteria live and develop under the same natural laws as their human competitors. They are part of the earth's family. No matter how fervently held the thought may be, diphtheria bacilli will not leave a sick child's throat—because the laws of nature do not allow them to. No matter how many vertebral buttons are pressed, no influence can be exerted thereby on our bacterial neighbors, be they old friends or new.

LIVING WITH ONE'S SELF

Rudyard Kipling said a number of things very abstrusely on the occasion of his installation as rector of St. Andrew's University, Scotland. But he had one thought which is worth disentangling from his words. "After all, you, yourself, are the only person you can by no possibility get away from in this life and maybe not in another," is the way he put it. "It is worth a little pain and money. Be good to him. Let your counsel be your heart, for there is no man more faithful to thee than it. For a man's mind is wont to show him more than the seven watchmen who sit above in a high tower."

That is far from Kiplingesque in expression, but it is important. However close to us father, mother, brothers, sisters, wife, and children may be, they are casual acquaintances compared to ourselves. Sleeping or waking, at work or in play, in failure or in success, in hardship or in luxury, we can never for a single moment from the cradle to the grave shake off our own ego. It dogs our footsteps or supports them; it depresses or inspires us; it bores or entertains us.

If we could choose this most intimate attendant on our path of life, most of us would choose one somewhat different from that we have. We would have it materially successful, merry and carefree, perhaps, or we would have it studious, profound, and creative. We would never have it inclined to despondency, weakness, and temperamentalism, as so many are upon occasion.

But we cannot choose. The ego with which we live is born, grows, and dies with us. The best we can do is to train and improve it as we may train and improve body and mind. We can make it tolerable or intolerable, both to ourselves and to others. We can cultivate it into a good friend and companion, or let it grow wild into an enemy and an irritant.

Most of us develop a sort of hybrid character between the two. On one day we think well of ourselves and enjoy living. On another we think ill, and are more or less contemptuous of life. In either case it is the same ego with which we are in contact. We can make it behave if we keep interminably on the job. To live with ourselves on pleasant terms we must do just that. In the course of time such a properly trained ego can be depended on to take the pleasant course in any circumstances. When that stage is reached the problem of life is solved.—*Chicago Tribune.*

Plain Facts about Health and Disease

HEALTH NEWS OF THE MONTH

Intravenous Dye Injections

For several years workers in the Brady Urological Institute of the Johns Hopkins Hospital have been endeavoring to secure a method for treating successfully general infections in man. Such general infections—usually called septicemia, which indicates that the poisonous matter is circulating in the blood—constitute some of the gravest problems confronting the physician.

For instance, one form is the generalized infection that may follow childbirth; another is that serious form of infection which attacks through a small wound made merely by the prick of a pin, or the accidental cutting of his own finger by a scalpel while the surgeon is operating on an infected patient. In other cases, smoldering infections which are localized in the abdomen, or in any organ, may suddenly burst into flame and attack the entire body.

The method of treatment used by the Maryland physicians involved the injection of either of two substances, mercurochrome-220 or gentian violet. Mercurochrome is so named because it consists of mercury, an element known to have remarkable properties in attacking germs, and a chrome substance which is a dye. The number "220" is added to show that this was the two hundred and twentieth combination studied by the investigators, just as arsphenamin was formerly called "606," because it was the six hundred and sixth combination studied by Paul Ehrlich. The gentian violet is a dye which seems to have the property of staining a specific organism, known as the staphylococcus, so called because it is a round organism occurring in groups or bunches.

Cases recently reported by the workers at the Johns Hopkins Hospital included seven treated by the mercurochrome and five by gentian violet. It was the belief of the investigators that in several instances the lives of the patients were saved by the new method. Patients treated by gentian violet were also classed as "desperate cases."

While the number of cases is small, the evidence indicates that the injection of these remedies directly into a vein constitutes a remarkable achievement, and further study will define the limitations of the work.

Examining the Gall Bladder

Almost every one knows that it is now possible to give to a patient a drink, containing such substances as barium sulphate, and then by the use of the x-ray to observe the action of the stomach and intestines.

Obviously, it would be highly desirable to use similar methods for examining other internal organs, and medical investigators throughout the world are searching intensively for such methods. Recently workers in the Washington University Medical School in St. Louis have evolved a method for examining the gall bladder.

It is known that certain substances when injected directly into the blood, or when taken into the body by mouth, are excreted into the bile by way of the liver; for example, such a substance as the sodium salt of tetrachlorphenolphthalein is excreted in this way. It is also known that iodids when observed under the x-ray are sufficiently opaque to throw a shadow, just as are the substances used for examining the stomach. However, the combination of iodin with the phenolphthalein is toxic and it could not be used. It occurred to the investigators, therefore, that some substance might be found which would lie midway between the chlorin combination, which is not sufficiently opaque, and the iodin combination, which is sufficiently opaque but is also toxic.

Such a substance was found in the form of the calcium salt of tetrabromphenolphthalein; when injected into the veins, it was excreted into the bile and appeared in the gall bladder.

Definite and distinct shadows of the gall bladder were observed when patients who had been injected were exposed to the x-ray. Incidentally it was found that patients with normal gall bladders showed much more definite shadows than those in whom the gall bladder was diseased. This fact in itself can be utilized as an aid in diagnosis.

Chlorin Gas to Prevent Colds

Newspapers have had much to say of the use of chlorin gas for the prevention and treatment of diseases affecting the nose, throat and lungs. From time to time reports have appeared in medical journals indicating that the inhaling of chlorin gas had caused the disappearance from the nose and

throat of such germs as the meningococcus, which causes meningitis, and of the diphtheria bacillus, causing the disease of the same name.

Investigators at the Medical Corps of the United States Army stationed at the Edgewood Arsenal have been conducting experiments under controlled conditions to determine the limitations of the method. They have devised an apparatus by which measured quantities of chlorin can be released in a room, and they have treated ninety-three patients in ordinary rooms, giving them from one to two hours of treatment.

They found that the chlorin as used had no general effects on fabrics and metals, and the statistics which they cite cause them to believe that the method had distinct beneficial effects in common colds, influenza, whooping cough and other diseases in which the bacteria were located on the surface of the membranes of the breathing apparatus.

The work done by the investigators lays the foundation for more extensive studies which will permit a final opinion as to the practical value of the method. It is significant as demonstrating the way in which science studies every possible method and chemical substance to attack disease germs with the greatest efficiency.

M. F.

THE PROPER DIET

AN ADEQUATE diet involves the eating of a sufficient amount of food to provide energy for the daily work. It must include a certain amount of protein, carbohydrates and fats and also inorganic substances such as salts. Furthermore, as a result of recent studies it has become clear that there must be enough of the essential vitamins, which give to the food certain properties necessary for body growth and the promotion of nutrition. Then again, food must have bulk sufficient to encourage proper action of the digestive organs.

As is indicated by an editorial in the *Journal* of the American Medical Association, "the desire to eat is a compelling feature of all human experience," and the antidote to the desire is the development of a feeling of fulness or satisfaction. This feeling, which contrasts with the sensation of hunger, is concerned with the elements of food only so far as it relates to their tendency to remain long in the stomach.

Many years ago, a physician at Fort Mackinac, Dr. William Beaumont, was able to observe digestion in the stomach of a soldier, Alexis St. Martin, who had been wounded in such a manner that the opening permitted observation directly into the stomach while food digestion was going on.

Since that time, many other investigators have studied these problems both in animals and in man. The results show that some foods make greater demands than others on the digestive organs. Some remain within the stomach for long periods and others only for a little while; some cause the stomach to secrete large amounts of digestive juices, and others require but little. Furthermore, a full stomach empties rather slowly, whereas emptiness of the stomach brings about "hunger contractions." It is known that the protein foods require more digestive juice than do those which are chiefly carbohydrate. Bread passes from the stomach within an hour and a half, whereas a combination of bread and meat will require two or three times as long before it passes from the stomach.

The degree to which foods induce a feeling of fullness depends on the rate at which they leave the stomach, and it is pointed out that according to this criterion, meats keep the sensation of appetite satisfied longest. After meats, fats and such mixtures of fat and protein as are represented by cheese, induce a feeling of satiety. The substances remaining for the shortest intervals in the stomach are cereals and starchy foods.

Of course the choice of a diet must take into account all of these factors and in addition the ability of the digestive tract in the individual concerned to care properly for the food after it is eaten. The experiences of the individual will help him to determine what substances best meet his needs as to the provision of energy, satisfaction of appetite and ease of digestion.

M. F.

SUMMER CAMPS FOR EMPLOYEES

INDUSTRIAL camps are most recent among developments of an interest of employer in employee. The idea is typical of America outdoors for summer.

Argument for the plan from the employee's viewpoint is hardly needed. He is provided thereby with equipment and facilities for outdoor life that the man of low salary or wage can ill afford to secure for himself. The company that takes over land and makes a pleasure spot for the vacation of its employees is apt to make its efficiency expert look to his job. It gets an appreciable return in a more healthful, optimistic personnel.

A model industrial camp such as that operated by the Pacific Electric Railway company in the Angeles forest in California is operated

at cost. Equipped with floor tents, furnished cabins, a store, cafeteria and large hall for dancing and amusements, it furnishes a center for the company's 5,000 employees, who are given two weeks' vacation with pay. Swimming, boating, hiking, fishing, and nature lore make its program.

Like the municipal camp, this idea is one that is sure to become increasingly popular. Only a few points need be kept in mind for success.

The camp should be far enough from the city or location of the company's plant that the employee will feel he is going somewhere. Scenery is important. Lakes and mountains are, of course, ideal.

Drainage, particularly in regions of summer storms, must be studied. The spot that is apt to be soonest dry after a downpour should be selected. Right methods of garbage disposal, immaculate cleanliness of kitchen and dining rooms need scarcely be mentioned.

As a promoter of fellowship that will be returned to the company with interest a hundred times in the course of ensuing months, a huge open fireplace should be provided for camp evenings.

A. G.

MEDICAL EDUCATION—A CONTRAST

DURING the first week in March more than four hundred medical educators met in Chicago to discuss the problems of medical education in America. The report of Mr. Abraham Flexner, secretary of the General Education Board, contrasting conditions as they existed in 1909 with those of today was encouraging.

"Except for the damage done by the war," he said, "Western Europe continues to work along the same lines that existed prior to the war. Equipment is good, facilities abundant, and conditions uniform within each of the countries. There is no fundamental or thorough-going distinction to be made between the various institutions of any given country. The same standards of admission prevail, the student body is of the same high quality, and the faculties are relatively complete. In England alone, while general conditions remain what they were, have two interesting developments taken place, namely, the establishment of the full-time medical and surgical units, and the creation of the Medical Research Council for the purpose of subsidizing research."

Mr. Flexner then pointed out that during the same period America has accomplished what at first sight looks like a transformation. The more than 150 schools which existed in this country fifteen years ago have been reduced by one half. Weak schools have been almost wholly eliminated, equipment and facilities have been improved, and well trained teachers are conducting the education of students in the fundamental medical branches. Mr. Flexner explained our relatively quicker progress by the fact that we had further to go than did foreign institutions.

Credit for the advance he assigned definitely, first, to the Council on Medical Education of the American Medical Association, and secondly, to a few leading schools and to a few individuals who have had the situation seriously in mind. The chief criticisms were leveled, however, at the unevenness of conditions existing today. "Between the best and the worst," he said, "yes, between the best in Class A and the poorest in Class A, the differences are hardly less pronounced than they were fifteen years ago. The best have improved, the poorest have improved, but there is almost as great a stretch between the best and the poorest as there was between the best and the poorest fifteen years ago." He asserted, moreover, that the unevenness existing in preliminary education was even more marked.

"On the face of the papers," he said, "a four-year high school education followed by two years of college work is in the United States required for entrance to a medical school. This looks like uniformity. As a matter of fact, the high school situation in America is utterly chaotic and the college situation hardly less so. No definite meaning whatsoever can yet be attached to graduation from a four-year high school, or to the completion of two years of college work. It means one thing to be a graduate of the Boston Latin School and an entirely different thing to be the graduate of a four-year rural high school in any section of the country. What two years of college work mean, I defy anybody to say. They may mean two years of hard work under favorable conditions; they may mean two years of spoon feeding by college instructors; they may mean two years of skilful cramming by the successors of the late Widow Nolen. Contrast this chaos with the definite standard of intellectual attainment indicated by the certificate of graduation from a German gymnasium, a French lycée, or the honors course of an English secondary school."

Mr. Flexner ended his paper with a plea for a more cosmopolitan training:

> The men who, a generation ago, gave American medicine its momentum were men of cosmopolitan training; they knew the best in our own country, Great Britain, France and Germany. They read and spoke German and French; they had intimate personal associations with the prominent European workers. As conditions have, however, improved in America, workers have tended to stay at

home. The best of them can read scientific German or French, but amazingly few can really read or speak any language but their own; and they have no such personal intimacies as their predecessors. Now, however much we have improved, we are not good enough to be sufficient unto ourselves, and we never shall be. Science is international; it advances in most unexpected fashion, now here, now there. And stimulus does not communicate itself best through the printed page. Men must know one another and work with one another. Mere Cook's touring through scientific laboratories abroad does not suffice. We must return to the old way of spending a couple of years in Europe, just as Europeans are getting in the way of spending a year or two with us. At the moment, expense makes this a serious matter; perhaps it can never be as common as is desirable. But for the leaders and those who aspire to leadership, cosmopolitan training is absolutely indispensable. If the fact is once recognized, ways can probably be found to circumvent the economic difficulties. M. F.

HOW ANIMAL EXPERIMENTATION AIDS ANIMALS

THE unthinking reader is likely to believe that the chief benefits of animal experimentation are conferred on man, and that he is in the position of the strong benefiting by the suffering of the weak; on the contrary, as has been specifically shown many times previously, the greatest benefactors from animal experimentation are the animals themselves.

In a special statement on the subject, Dr. John R. Mohler, chief of the bureau of animal industry, has pointed out some of the ways in which animals have benefited by scientific research.

Previous to 1906, the cattle of our southern states were affected with Texas fever, which killed large numbers every year and caused many others to become wasted and worn with disease. Experiments made on animals revealed the fact that the disease was carried from animal to animal by a blood-sucking insect called the cattle tick. It followed logically that elimination of this tick would cause disappearance of Texas fever. The department of agriculture undertook to clean out this insect from the herds of the South. Arrangements were made for regularly dipping the cattle in a solution of insecticidal material.

As a result millions of cattle have been permitted to live in health and comfort, and the economic saving has been tremendous. The discovery of the cattle tick led, moreover, to a broadening of the conception of the way in which human disease is transmitted. This discovery was the beam which illuminated the darkness representing at that time our lack of knowledge of yellow fever and malaria.

In its published statement, the Department of Agriculture shows how investigators, while studying the internal parasites of dogs and sheep, found a chemical substance which has great efficiency in removing hookworm. Reports coming from every corner of the world show that this chemical—carbon tetrachlorid—is an effective substance for fighting hookworm.

Today the Department of Agriculture is studying the effects of poisonous plants eaten by animals. The eradication of such plants will mean the elimination of unimaginable suffering and torture to millions of animals, and save the lives of thousands which die every year as a result of eating such plants.

Development of tuberculin tests for cattle and of anti-hog cholera serum depended definitely on animal experimentation. In this development a few hogs and cattle were caused inconvenience and perhaps gave their lives, but how many hundreds of thousand have lived as a result!

Dr. Mohler tells in his statement what the Department of Agriculture is doing to prevent animal suffering in shipment, and in preparation for food. Deaths of stock in transit have been reduced in the past three years to considerably less than one per cent.; animals are well handled, properly fed and frequently watered. Numerous inspectors see to it that the laws governing humane shipment are obeyed. In concluding his statement, the head of the bureau of animal industry gives credit for most of the advances to scientifically controlled animal experimentation.

"The United States," he says, "has become the greatest livestock country in the world, and one of the reasons for the attainment of this position is that in this country much time and money have been spent in developing methods of preventing and eradicating diseases and adding to animal comfort. The scientist has been looking at the great herds and flocks that provide so much of our wealth and not at the individual that followed Mary to school." M. F.

THE SUPPLY OF PHYSICIANS

IN THE Congress on Medical Education recently held in Chicago, Dr. N. P. Colwell, secretary of the Council on Medical Education and Hospitals of the American Medical Association, presented some significant facts as to the needs of medical education and as to the supply of physicians.

Criticisms have been made that our medical schools have been so highly developed, and requirements for admission so greatly raised, that it is difficult for students to gain admission. However, the actual figures assembled by the

Council indicate that in 1921-1922 the sixty-six medical schools in class "A" had a total capacity of 15,925 students, whereas only 12,610 students were enrolled. At present the seventy medical schools in class "A" have a total capacity for 17,955 students with an enrollment of only 16,736, so that ample space remains for 1,219.

These figures are especially significant in view of the fact that class "B" schools report an enrollment of 592, and class "C" institutions an enrollment of 480. Thus all of the students in the lower grade medical schools could have been accepted in high grade medical schools if they had been properly qualified.

Dr. Colwell also discussed the assertion that the number of physicians is diminishing proportionately and that there is to be a shortage. The actual figures show that in 1921 there were 14,466 medical students; in 1922, 15,635; in 1923, 16,960, and in the present year approximately 17,808. Since 1919, therefore, the annual enrollment in medical schools has increased at the rate of approximately one thousand students each year.

In concluding his remarks, Dr. Colwell stated that an investigation of the supply of physicians in rural districts has just been completed under the direction of Mr. Abraham Flexner and the General Education Board.

This survey reveals that an actual scarcity of physicians does exist in rural communities and that it is becoming more pronounced. The investigations show also that the scarcity is due to economic conditions which have resulted in an unequal distribution of physicians, and that it is not due to any shortage of medical graduates.

M. F.

PROMOTING LONGEVITY

PRACTICALLY all of the functions of the practice of medicine are directed toward the promotion of a longer life. In a recent consideration of the subject, the director of a great insurance company points out that our habit of alleviating pain as the first function has sometimes caused physicians to overlook the more fundamental problems involved in keeping the well person well and in postponing the development of serious conditions in those approaching sickness.

These fundamental problems are beginning to be met by such services as are involved in periodical physical examinations. The evidence accumulated by this insurance company in its studies of the subject indicates that the mere examination of the urine at various intervals is not sufficient to warrant any reliance. It leads to needless apprehension in many instances, and what is more serious, at times causes people to think that they are free from disease, because many serious diseases do not show their first manifestations in the urine. In fact many show no manifestations at any time in the urine. It is certain, for example, that the beginning and development of cancer is in no way revealed by urine examinations.

The experience of the insurance company in the offering of a complete diagnostic service to its policy holders brought out many important facts as to the scope of an examination of the presumably healthy person when that examination was directed primarily to the problem of keeping him well. It was found that persons competent to make an ordinary clinical examination would be equally competent to make an examination of the healthy in order to determine the status of health.

A few simple tests are necessary to decide on the normality of vision, hearing and the special senses. The examination of posture and lack of weakness in the feet is not necessarily a diagnostic problem for the specialist. Nutrition can be determined by simple questions and the use of a scale and is an important feature of the health examination because almost every person needs enlightenment about the matter of diet, the tendency to overeat and the existence of various food fads. Indeed, the complete routine of the health examination is simply what any competent physician does on first seeing a patient. Finally, the importance of adequate records kept year after year as contrasting the growth and breakdown of the human body cannot be overestimated.

The experiences of the medical profession, and particularly from the economic point of view, that of the great insurance companies, indicate unquestionably the value of regularly repeated physical examinations for those who wish to remain well and to live long. It is a fact which HYGEIA has stated before and which will bear monthly repetition.

M. F.

HYGEIA LIGHTS A CANDLE

THE first anniversary, whether of birth, marriage or business, marks a period more significant than those which occur so rapidly after the straits and tests of the first year have been passed.

So it is that April finds HYGEIA receiving graciously the salutations and good wishes of the many from near and far, professional and laity, who a year ago called: "Welcome. The world has need of you."

A. O.

The Friendly Brushes

HARRIET WEDGWOOD

CHARACTERS

Scrubbing Brush	Brush Man
Toothbrush	Floor Brush
Nail Brush	Floor Mop
Sink Brush	Dry Mop
Bathtub Scrub Brush	Corn Broom
Nail Stick	

The Brush Man is Hygiene, or "Hy Jean," if one likes it so. Scrubbing Brush and Sink Brush are old and well worn brushes.

The children carry the brushes or mops indicated by their names, Toothbrush carrying a gigantic toothbrush. Feather Duster may have turkey feathers sewed to her shirt, to make her look like a duster. A little ingenuity will suggest costumes.

When the curtain rises, Brushes are walking about the stage, some hanging their heads as if they were tired, and sighing loudly. Scrubbing Brush sits on an upturned pail with his head in his hands. Feather Duster is trying to come on the stage, but when she gets on a little way, the other Brushes push the crowd off her. She tries a number of times, but is not allowed on the stage.

SCRUBBING BRUSH *(Sitting on upturned pail, with his head in his hands).* Oh, but I'm tired. I'm worn down to my last bristle.

SINK BRUSH. So'm I. I've scrubbed every sink on the Healthway. But, my, my, you ought to see 'em shine.

BATHTUB SCRUB BRUSH. That so? Well, you ought to see my bathtubs.

DRY MOP. Who's that trying to get on the stage? Feather Duster, as I'm alive. We've pushed her off several times already, but she tries to come back.

SEVERAL BRUSHES. She can't come here. She's been told that before. She doesn't do good work. Instead of getting rid of dust and dirt, she just brushes it off from her place to *ours,* for some of us to take up. That's not what *we* call good work.

NAIL BRUSH *(Addressing Scrubbing Brush).* You do look worn out, that's a fact.

SCRUBBING BRUSH. Well, that's all right. That's what we're made for—to wear out. Everybody wears out in time, and I've worked a long time. I've done good work, too. I'm proud of it. My bristles aren't so stiff as they once were, but nobody can say there have been dirty floors on the Healthway since I've had charge of them.

CORN BROOM. That's right. They say a new broom sweeps clean, but I have found the floors clean when I began.

SCRUBBING BRUSH *(To Toothbrush).* What have you been doing, Sister?

TOOTHBRUSH. Polishing pearls.

SEVERAL BRUSHES. Polishing Pearls!

TOOTHBRUSH. That's what. Twenty pearls, all right in one mouth.

ALL BRUSHES. Oh, teeth!

TOOTHBRUSH. Sure, teeth. But they wern't pearls when I started with them. They were—well, they weren't very nice. But now—you ought to see them. They're beautiful.

NAILBRUSH. Whom do you work for? Peggy?

TOOTHBRUSH. Yes. I never work for more than one person during my lifetime. We toothbrushes are right fussy.

NAILBRUSH. I should say you are. Well, we are not *quite* so fussy, but we are pretty fussy, too. We insist on the right care—sun and air, you know. But speaking of Peggy,

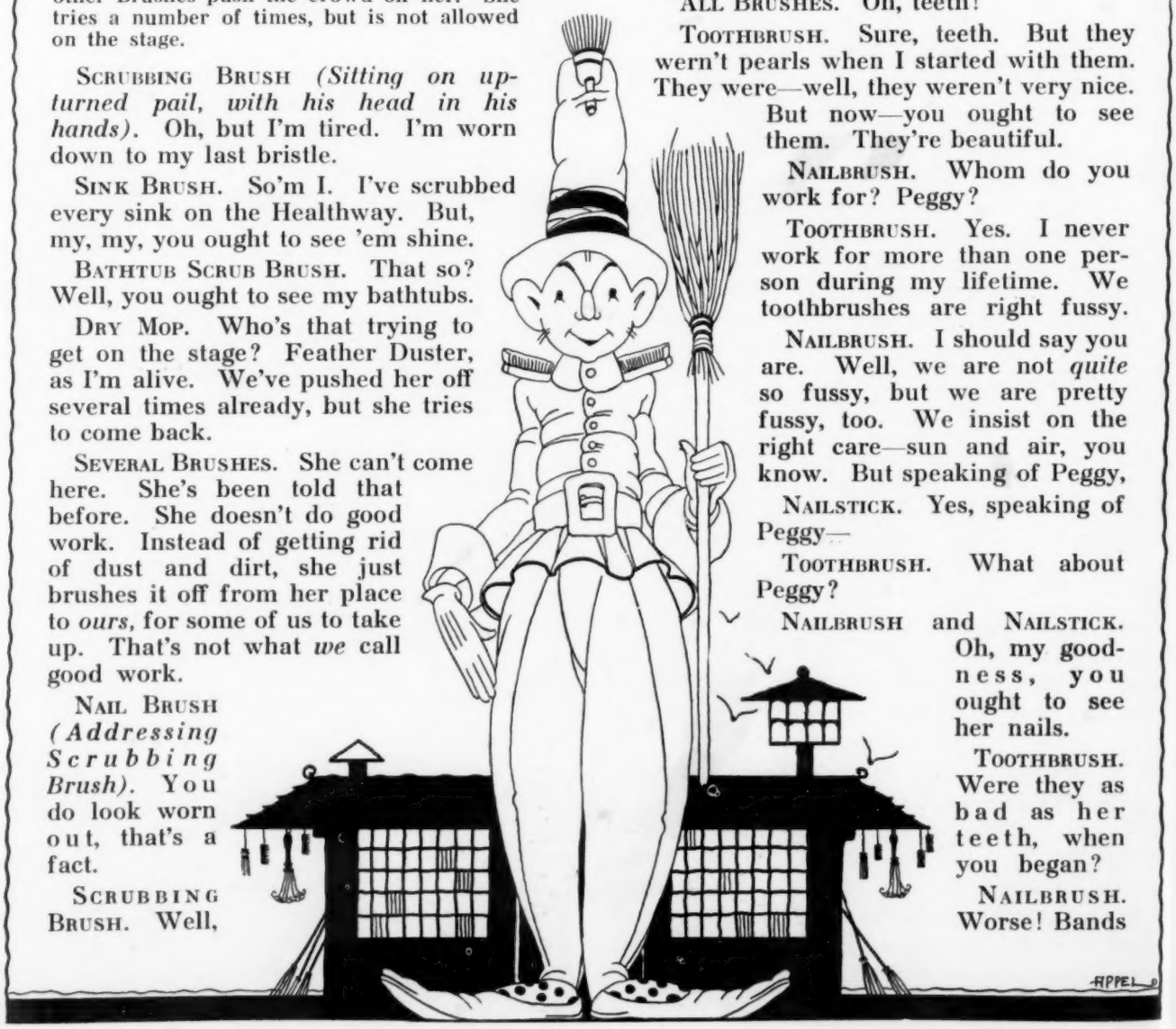
NAILSTICK. Yes, speaking of Peggy—

TOOTHBRUSH. What about Peggy?

NAILBRUSH and NAILSTICK. Oh, my goodness, you ought to see her nails.

TOOTHBRUSH. Were they as bad as her teeth, when you began?

NAILBRUSH. Worse! Bands



of mourning on every nail—oh my, oh my!

NAILSTICK. We couldn't let her come on the Healthway till she got them clean; and I saw to that.

NAILBRUSH. You never saw prettier hands and nails now—they are lovely. Nails like pink and white sea-shells.

The BRUSH MAN comes on the stage. *(He has brushes hanging all over him.)*

BRUSH MAN. Hullo, friends. Some of you look all worn out. I've come to give you a lift; new brushes for old. *(He goes to Scrubbing Brush and gives him a new brush for his old one. Scrubbing Brush jumps up as if he had new life in him. The same with Sink Brush, and one or two other Brushes.)*

BRUSH MAN. I tell you I am proud of the work you have done. Every corner of the Healthway is clean and shining. I am going to give you Brushes a well earned vacation, but before you go, you must teach the new Brushes who will take your places. Here they come!

A new group of actors troop on the stage, one for each actor on the stage (In this group there will be no Feather Duster, and there is only one Brush Man.)

BRUSH MAN. Scrubbing Brush, here's the man that will take your place. But you must teach him all you know. Teach him that you must have clean water if you want to get anything clean. And Toothbrush, teach this new Toothbrush that on the Healthway we always run upstairs and downstairs, not back and forth. You show him how. And all the rest of you, every man of you, teach your new men carefully. I hope they will do as good work as you have done.

SCRUBBING BRUSH. Let's sing a song:

All sing (to the tune of Yankee Doodle):

All the Brushes that we know.
Are busy on the Healthway,
Monday, Tuesday, Wednesday, Thursday,
Friday, yes and Saturday.
Some are busy Sundays, too,
NAILBRUSH comes in handy;
TOOTHBRUSH, too, at morn and night
To keep things spick and spandy.

BRUSH MAN. Anybody else have a song?

SCRUBBING BRUSH. I'm feeling better. I might sing you the song of the SCRUBBING BRUSH. *(He sings, also to the tune of Yankee Doodle.)*

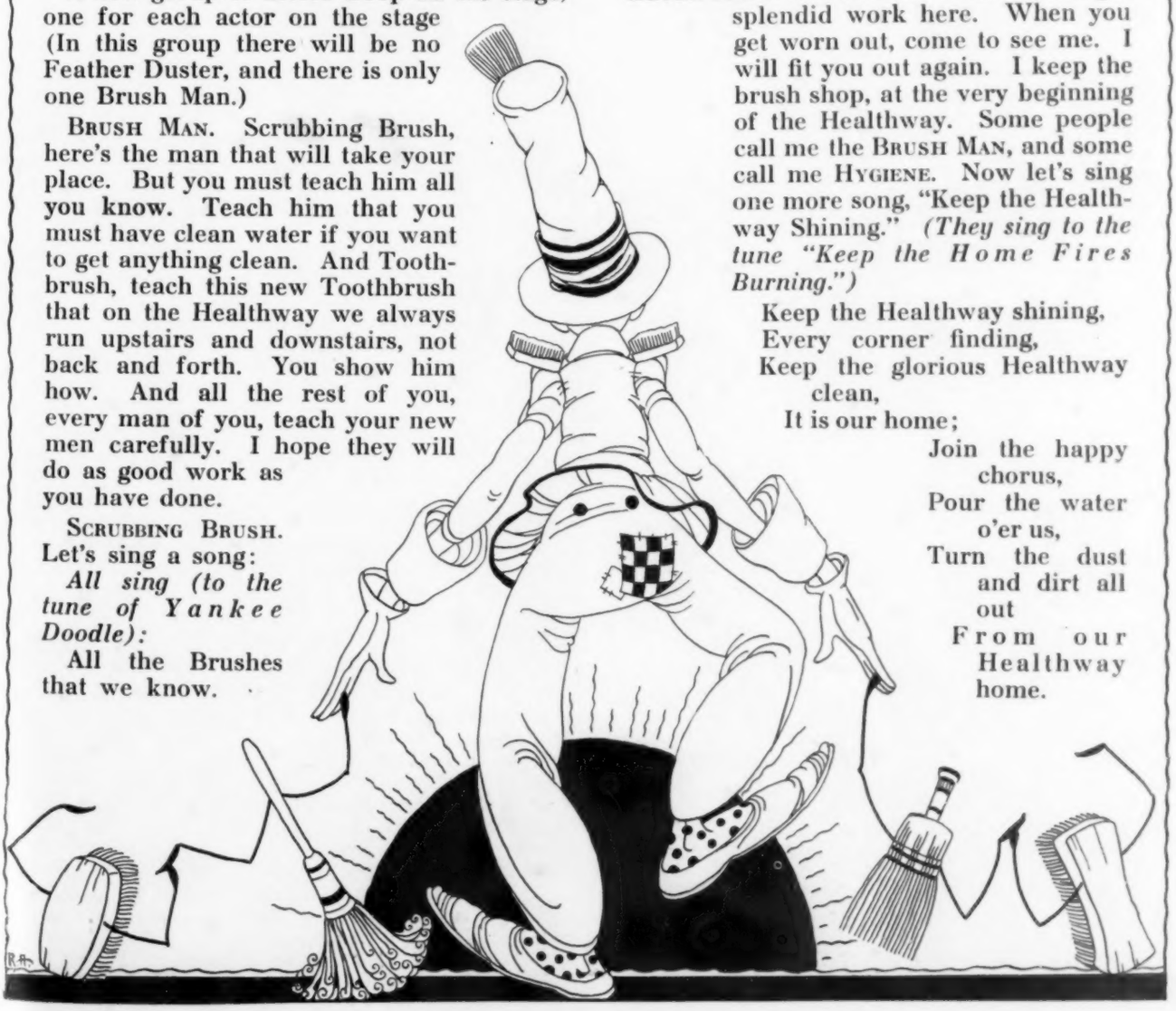
I am just a Scrubbing Brush,
And always do my duty;
When I finish scrubbing up
The floor is a beauty.

Now everybody sing! *(All the Brushes join in on the chorus.)*

We are brushes, good and clean,
Always near and handy,
On the Healthway we are glad
To keep things spick and spandy.

BRUSH MAN. That's fine. You are doing a splendid work here. When you get worn out, come to see me. I will fit you out again. I keep the brush shop, at the very beginning of the Healthway. Some people call me the BRUSH MAN, and some call me HYGIENE. Now let's sing one more song, "Keep the Healthway Shining." *(They sing to the tune "Keep the Home Fires Burning.")*

Keep the Healthway shining,
Every corner finding,
Keep the glorious Healthway clean,
It is our home;
Join the happy chorus,
Pour the water o'er us,
Turn the dust and dirt all out
From our Healthway home.



HEALTH NEWS AND VIEWS

NO PLAYGROUNDS, BAD CHILDREN

Juvenile delinquency, in Cincinnati at least, occurs most frequently where playgrounds are lacking.

A careful platting of the records shows that in almost every ward in Cincinnati where playgrounds are few, the peak of delinquency is the highest, said C. H. Meeds, chief engineer and executive officer of the park department in that city, in a recent address.

Where play space is provided, delinquency drops off to a marked degree, Mr. Meeds declared.

Court records show that in one case, covering a period of three years, delinquency was reduced more than 67 per cent. after the opening of a playground in that neighborhood.

Such evidence as this seems to prove that money expended in playgrounds will make many returns on the original investment, so far as it helps not only to prevent wrong doing, but also to create a better class of citizens.

SUMMER COURSES IN PUBLIC HEALTH

There is a rapidly increasing demand for instruction in public health work by physicians, nurses, and many others who are engaged, or who plan to engage, in public health work of various sorts. The recent development of new health movements (industrial hygiene, child hygiene, social hygiene, mental hygiene, cancer control and tuberculosis work) is creating a field for many workers.

The U. S. Public Health Service has therefore decided to offer courses in public health work in some of the universities during the coming summer.

Announcement is made that such courses will be conducted at the University of Iowa, the University of California, the University of Michigan, and at Columbia University in New York City.

Lectures will be given by representatives of the department and members of the faculties of these schools and will cover a wide range of public health topics.

In another health education project the U. S. Public Health Service will cooperate with the state health departments of New England, the Yale and Harvard schools of public health, and the department of biology and public health of the Massachusetts Institute of Technology and Simmons College.

About 1,000 physicians, dentists, nurses, social service workers, teachers and others engaged or interested in public health work will attend the New England Health Institute in Boston, May 5-10.

The institute will be held in thirteen sections, among them tuberculosis, child hygiene, foods and food control, mental hygiene and health examinations. Each section will have as chairman a recognized leader in the field of work to which it is devoted. Dr. Merrill Champion of Boston is chairman of the program committee.

DANGER IN PIPELESS GAS STOVES

Health departments in several cities are attempting to suppress the use of pipeless gas stoves in living rooms and nurseries.

In a stove that has no pipe, carbon monoxide gas sometimes accumulates in the air and because it is highly poisonous overcomes the occupants of the room before they realize their danger.

Carbon monoxide gas is more poisonous than prussic acid or the war gases, and is particularly treacherous because it is colorless, tasteless and odorless. Because of these properties it may be present in sufficient quantities for suffocation and the occupants of the room will not be aware of it.

Many cases of death due to acute carbon monoxide poisoning from inhaling the air in rooms heated by pipeless gas stoves are noted in the daily press.

If the head begins to ache severely and the knees to grow weak, one may suspect the presence of the gas and dash for the door or window.

In apartment buildings and places where pipeless gas stoves are provided, it is safest to see that there is always an ample supply of fresh outdoor air in the room.

In sleeping rooms, especially, the use of a pipeless gas stove is to be avoided.

ARE PUBLIC TELEPHONES CARRIERS OF DISEASE?

To learn if public telephones are carriers of disease, the British postmaster-general recently had a series of tests made with the telephone mouthpieces at busy call offices.

The results of his investigation were most favorable and the tubercle bacillus was not found, says the London correspondent of the *Journal* of the American Medical Association.

Not satisfied with the tests made at the public pay stations, the postmaster-general had telephones fitted in the wards of a sanatorium to be used only by patients in different stages of tuberculosis.

These instruments were in use for varying periods and were not cleaned or disinfected during the time of the experiment. Bacteriologists then inspected them and found no evidence of bacilli. The conclusion was that the transmission of tuberculosis through the telephone mouthpiece is so unlikely as to be almost impossible.

However, in London a staff of cleaners is employed permanently whose duty it is to disinfect telephone transmitters and receivers in all the public call stations regularly every three days.

AMERICAN HEALTH WORKERS ACTIVE IN LEAGUE OF NATIONS

Surgeon General Hugh S. Cumming of the U. S. Public Health Service has been named one of the vice presidents of the permanent health organization of the League of Nations which recently met in Geneva, Switzerland.

Other Americans appointed to positions of responsibility in the organization are Dr. Otto R. Eichel, director of vital statistics for the New York state department of health, who will direct the epidemiologic intelligence and statistics section of the league, and Dr. Alice Hamilton, professor of industrial medicine at Harvard medical school, who has been appointed a member of the permanent health committee.

QUEER HOUSES IN INDIA

Sanitary housing conditions are unknown in the town of Cot, in Baluchistan, Western India. Here dwells a tribe of the most primitive people in the world. The queer low huts are fashioned of branches and grasses and the people enter them by crawling in and out of the little doors on their hands and knees — dog fashion. As an added protection against wild animals, they can place stones and sticks against the entrance.

BAKING BREAD IN NEW MEXICO

In Laguna, Pueblo, New Mexico, Indian women bake bread in the same way in which their mothers and grandmothers baked it. An outdoor oven is built of clay and allowed to dry. Then a fire is built in the oven and when this fire is reduced to a bed of red hot charcoals, the loaves of bread are placed in the oven and baked until thoroughly hard and dry. Bread, as the Indians bake it, will never give you indigestion.

Photos by Ewing Galloway.

Pacific and Atlantic

INDIAN GAME GAINS FAVOR

Lacrosse, a Canadian game of Indian origin, has been introduced in California, and has been enthusiastically received by the young women there. This picture was taken at Santa Monica, California, where practice games are being played. The National Lacrosse championship was held in Los Angeles.

GIRL STUNT DIVER

Helen Wainright set a new world record for the 300 meter free style swim at Miami, Florida. Incidentally, this marvel girl swimmer is also a star stunt diver. She is shown here in the midst of a back dive.

Pacific and Atlantic

FAMOUS CREW OPENS SEASON

Eton School, England, famous for its rowing crew, has opened the rowing season much earlier this year, in order to give the crews more time for training for the well known Henley Regatta. American coaches are enthusiastic about this type of training, and where there are no facilities for exercise in water, they have had installed in the gymnasiums rowing devices for use in class work. Rowing develops the arm and back muscles.

Pacific and Atlantic

Pacific and Atlantic

NO MORE STREET URCHINS

Street urchins are becoming a thing of the past, and boys the country over are showing marked results in physical development, due to the fact that they are taking advantage of all gymnasium facilities possible. These Chicago boys are being examined in one of the large "gyms" of the city and are being instructed as to what sport would be best suited to improve their health.

International

HIGH SCHOOLS ORGANIZE FOR SAFETY

Safety Clubs are being organized in every high school in Southern California. The auto club there has for its slogan: "A police department in every school." The aim is to interest the older students in organizing for the safety of the younger school children. Here the safety patrol is leading the way across a dangerous street.

CURFEW RINGS IN PORTLAND

Curfew rings in Portland, Oregon. All boys and girls under eighteen found on the streets after 9 p. m., unaccompanied by their parents, are considered violators of the law and are taken before the newly organized night Juvenile court.

Pacific and Atlantic

FROM "BABY" TO "WISDOM" TEETH

Here's a table, furnished by the U. S. Public Health Service, which shows when our teeth should put in their appearance.

Of course there are cases of babies being born with teeth and of grandmothers excitedly discovering that they are cutting a "wisdom" tooth, but these are exceptional. The following table gives the age when the average person finds himself cutting new teeth:

Deciduous or first teeth:

Two lower front teeth, at 5 to 7 months.

Two upper front teeth, at 6 to 8 months.

Two more lower front teeth, at 7 to 9 months.

Two more upper front teeth, at 8 to 10 months.

Four back (molar) teeth, one on each side of each jaw, at 10 to 14 months.

Four more molar teeth, back of the others, at about two years.

Four cuspids ("eye" and "stomach" teeth) at 2 to 2½ years.

Every tooth, as it comes into place, is a milestone that marks another step in the child's development. It will not be until the cutting of all of its first full set of teeth has been completed that the mother may feel at liberty to give the child hard, solid food.

Permanent or second teeth:

Four first molars, one on each side of each jaw, 5 to 7 years.

Two lower front teeth, 5 to 7 years.

Two upper front teeth, 6 to 8 years.

Two more upper front teeth and two more lower front teeth, 6 to 8 years.

Four bicuspids, two upper and two lower, 8 to 10 years.

Two "eye" and two "stomach," 9 to 12 years.

Two upper and two lower second molars, 12 to 14 years.

Two upper and two lower third molars, 17 to 25 years.

SEX EDUCATION FOR CHILDREN

As a result of a recent recommendation of a committee of teachers and physicians, sex instruction will probably soon become a part of the curriculum of the Belgian schools.

The committee declared that the lack of such instruction constituted a defect in the educational system of Belgium and that ignorance of sex matters contributed largely to the spread of venereal disease.

Systematic courses of study will be organized, if the recommendation of the committee is carried out in full, beginning with the primary grades.

In the primary grades instruction would begin with a study of reproduction in the vegetable kingdom. In grammar school, the study would be carried on to a study of reproduction in animals. Pupils would thus be prepared for instruction in the development of the human embryo.

To carry out such a program, the committee advises that special courses for teachers in sex education be organized.

Every effort will be made to adapt the teaching to the age of the pupil, with a view to giving him an understanding of the physical and moral importance of reproduction.

Ewing Galloway

TILL DEATH DO US PART

These youngsters are bride and groom. They have just exchanged the accepted wedding vows of Borneo and are receiving a blessing by a Mohammedan priest.

The bride is almost twelve; her husband, nine. The marriage, of course, was arranged by the parents and the age of the principals is not uncommon in the Bajow Tribe to which they belong.

PHYSICIANS MUST TEACH THE PUBLIC

Many physicians entertain the ideas of the proper relation of the medical profession to the public which are expressed by the president of the North Texas Medical Association in his opening address at the recent meeting of that association at Fort Worth.

This officer urged members of the society to abandon their retiring attitude and carry on a campaign of education.

"Many diseases formerly dreaded have been rendered harmless through the advancement of medical science," he declared. "Smallpox, diphtheria, rabies, yellow fever, hookworm, malaria, social diseases, typhoid, appendicitis, granulated lids, tetanus, pellegra and other diseases have become controllable, and in many cases ills now result only from neglect.

"Cancer, tuberculosis, meningitis, diabetes and many other maladies are yielding to the victorious forces of scientific medicine. To perform our duty to the public we physicians must engage in the work of popular education.

"It may seem revolutionary to propose to the medical profession, which, through the ages, has relied on its self-sufficiency and modestly refrained from publicity to depart from that practice now, but let me remind you that this is an age of progress and of change. We are in the age of publicity.

"The popular mind is emerging from ages of ignorance and superstition and grasping for truth.

"Let us assume the offensive with science as our shield, and truth as our weapon."

QUESTIONS AND ANSWERS

If you have a question relating to health, write to "Questions and Answers," HYGEIA, enclosing a two-cent stamp. If the question is of general interest, the answer will be published; otherwise it will be sent by mail. Questions are submitted to recognized authorities in the several branches of medicine and answers framed by them. The names of correspondents will not be published. Diagnoses in individual cases will not be attempted nor treatment prescribed.

Wants White Hair

To the Editor:—I would like to know if you can change the color of the hair from light brown to pure white. Will it grow out white? How, by whom and where could I get this done?

I. E. J., Pennsylvania.

Answer.—There is no known method by which the color of the hair can be changed other than with dyes. It would therefore be impossible to change brown hair into white.

Influenza
Meningitis

To the Editor:—1. I am anxious to obtain information of "war time flu" or Spanish influenza, if that is the correct name of disease—cause, symptoms, etc. Does it originate with a "cold," coryza or rhinitis, or is it transmitted from one person to another by way of malignant germs? 2. I am also anxious to obtain all possible information on spinal meningitis, its cause, symptoms, etc. Is there any form of it called "influenzal-spinal meningitis" or can the former disease turn into the latter?

R. W. S., Kentucky.

Answer.—1. Influenza, popularly designated "flu," is a distinct, contagious, epidemic disease, doubtless caused by a living virus or germ, the exact nature of which is not certainly known. It probably has no relation to the common cold.

The disease is characterized by catarrhal symptoms, such as occur in a cold, fever, diarrhea, profound prostration, and complications of which pneumonia is most common.

2. Meningitis is caused by several bacteria. The usual form which occurs in epidemics is caused by a round organism called the meningococcus. Influenzal meningitis is caused by a small bacillus known as the influenza bacillus. When this name was applied, it was thought it was identical with what was then believed to be the cause of influenza. There is no apparent relationship between cases of influenzal meningitis and the prevalence of influenza.

In most cases of meningitis, the membranes covering both the brain and the cord are involved and so the term "cerebro-spinal" is better applied to them than "spinal" or "cerebral." The various forms of meningitis due to different varieties of bacteria are distinct and do not turn one into another.

Diet for Arthritis Patient

To the Editor:—I want to know if all wheat products rank high as uric acid producers. I would like a detailed list of food tending to increase uric acid in urine. What to eat for breakfast and supper is the hardest problem. I know I may eat vegetables. Are fowl and lamb as bad as the red meats? Are sea foods, such as salt mackerel, salt cod, smoked fish and oysters, prohibited? Different persons tell me of different articles that should be avoided until I hardly know what to eat. Which cereal is most free from acid? Arthritis is a feature of my rheumatism." M. B., Indiana.

Answer.—Wheat products do not rank high as uric acid producers. All animal foods, especially liver and sweetbreads, produce a great amount of uric acid. These foods contain a large amount of what are known as neucleo-proteids.

A meat diet gives more uric acid than a vegetable diet. Milk acts like a vegetable food, and, hence, it can be used freely. Fowl and lamb contain less extractives than red meats, and are to be selected when meat is used.

Fish is intermediate between meats and vegetables, and may be used in moderation. All cereals, especially those containing bran, may be taken. Individuals of a gouty tendency should eat freely of fruits and vegetables, cereals and milk, and use all other foods in moderation. Much less importance is attached than formerly to uric acid and the so-called uric acid diathesis.

Enlarged Tonsils

To the Editor:—Is it possible to cure enlarged tonsils without removing them? I have been advised by my physician to have mine out.

R. D. L., Pennsylvania.

Answer.—Various methods have from time to time been practiced with the view to curing enlarged tonsils without operation. They have been abandoned one by one. Most recently the x-ray has been advocated for this purpose, but at the present time specialists are not agreed on the desirability of its use. As a matter of fact, most of them are opposed to it, except in certain specially selected cases where operation, due to certain conditions, is undesirable. It is surer and safer to "have them out."

Tuberculosis Germs after "Cure"

To the Editor:—Do you think one has tuberculosis germs in the lungs after "cure"?

G. S., Washington.

Answer.—Yes, usually for months and years, but the tubercle bacilli are probably sealed in by scar tissue in the process of healing.

Jaundice
Pregnancy

To the Editor:—1. Does catarrhal jaundice have any after effects? Can it affect the kidneys or bladder in any way? I had an attack of it and there seems to be a tendency to urinate more frequently. 2. Would you please give the symptoms of pregnancy. Is it possible for a woman to be in that condition who has never been regular in her menstrual periods and whose flow has never been of a large quantity? I should be twenty-three or twenty-four weeks along the way if I am in that condition. I have had four menstrual periods since. My bust, waist, and abdomen have not increased in size. M. D., Wisconsin.

Answer.—1. Whatever caused the jaundice might cause damage to the kidneys. It would be well to have an examination to determine the cause of the jaundice.

2. It is possible for pregnancy to be present without an absence of the monthly periods. However, one would expect some change in the breasts by this time. Only by a careful examination by a competent physician can the question about pregnancy be properly answered.

Fattening Foods
Exercise

To the Editor:—1. For my age and height (50 years and 5 feet and 8¼ inches), I am 14 lbs. overweight. Am I dangerously overweight? This weight has not increased in the past year. Am I overweight enough to shorten life if there is no further increase? 2. Of the following foods which are fattening and which are not: cheese (mild), turnips, boiled and fried onions, asparagus, beets, string beans, shelled or kidney beans, baked beans, peas, lima beans, brown bread, graham bread, white bread, boiled baked or fried fish, clam and fish chowders, oyster stew, vegetable soup, beef stew or soup? 3. Is skimmed milk fattening and does it contain as much nourishment as whole milk, which is fattening? I can drink whole milk by the quart. 4. Are the various kinds of breakfast cocoas fattening, such as Baker's, Lowney's, and Dutch Cocoa? I drink cocoa twice a day the year 'round. I never drink tea or coffee. 5. What are the four most common causes of death of men past 50 years of age? 6. I walk on an average of ten miles a week, which I know is more than the majority of working men do. Is this exercise enough for me, considering my age and amount of overweight? If I walk too much in the day I don't sleep so well at night, and I only average four or five hours a night anyway.

S. F. O., Massachusetts.

Answer.—1. The patient is not dangerously overweight; certainly not enough to shorten life if there is no further increase.

2. The question of fat does not depend on the kind of food so much as it does the amount taken. Sugars, pastries containing sugar, bread, potatoes, butter and cream are the most likely to produce fat, and none, at least in the ordinary quantities taken, need be considered seriously.

3. Skimmed milk has the fat removed and therefore does not contain as much nourishment as whole milk.

4. Breakfast cocoas are not fattening, except for the cream and sugar that are put in them.

5. The four most common causes of death in men past 50 are heart and kidney disease, cancer, cerebral hemorrhage and pneumonia.

6. The question of exercise for a man of the age of the patient is always interesting, because what is good healthy exercise for one man is too much or too little for the next. This can only be decided by the individual's reaction. Since the patient does not sleep if there is too much walking, there is nothing gained by increasing or diminishing exercise.

Excess of Mucus
Electric Treatment for Tonsils

To the Editor:—1. I am anxious to know about the mucus which I can cough up out of my head at almost any time. My breathing is normal. Sometimes I notice small hard lumps. I have no pain whatever. 2. Do you advise the electric treatment for tonsils that are hardly affected? The person has had sore throat twice and was advised to take an electric treatment.

M. C. P., Wisconsin.

Answer.—1. Excess of mucus or mucopus is not a normal condition in the nose even though the breathing is free. It would be a good plan for the patient to see some competent physician for an examination as to the nasal condition.

2. The electric or x-ray treatment for tonsils is still an experimental method. If there is tonsillar infection present, the removal of the tonsils is the best procedure.

Exercise After Operation

To the Editor:—Last April I underwent an operation for both uterine tumor and appendicitis; at the same time the entire uterus and the ovaries were removed. I am forty-two and have never had a symptom of menopause. I have gained in weight considerably and have no trouble at all except a slight soreness in the right side of the abdomen after sweeping or any work that requires stooping. As my life was despaired of for several months following the operation, I have not dared to take active exercise, but I am now feeling so much better that I should like to take some kind of exercise. What do you think of going in for physical culture? Am I in a safe condition to take a two-mile walk every day? Should I constantly wear a brace or support of some kind? Do I need to expect any symptoms of change of life, since all the organs are absent? Does such an operation as mine shorten a woman's life?

N. L., Kentucky.

Answer.—Fresh air and carefully regulated exercise out of doors would be more beneficial than physical culture. Exercise should not be of a strenuous character and should be limited to an amount less than that which produces fatigue or discomfort.

Operative removal of the female organs does not shorten life; on the contrary, one may live longer and enjoy improved health. An abdominal support is unnecessary unless there is a weakness or rupture of the scar.

If the ovaries were completely removed at the time of operation, the patient has already experienced change of life. The symptoms of this period are often so slight as to escape notice.

Fibroid Tumors of the Uterus

To the Editor:—Will you kindly send me all the information you can regarding fibrous tumor of the uterus; its cause, symptoms, treatment and cure? I have high blood pressure. Have had it as high as 236, but it has gone down to 200, 180 and now to 160. What do you think of the radium cure?

G. W. M., Illinois.

Answer.—The cause of fibroid tumors of the uterus has not been discovered; it is believed that local injuries or infections play a part in their development.

Relief is obtainable through radium treatment or operation. The use of radium may be preferable in women near or beyond the menopause, provided the tumors are not large and there are no associated troubles requiring surgical intervention.

Moderately high blood pressure does not stand in the way of an operation, provided the heart and kidneys are in satisfactory condition.

Worms

To the Editor:—1. Just how can it be told if a person is afflicted with worms? What are the symptoms? 2. What are the cures and how are they administered?

I. B., Wisconsin.

Answer.—1. There are no symptoms characteristic of the presence of intestinal parasites. Persons may have worms without showing any symptoms. On the other hand, severe manifestations may result. This variability depends on the species and the number of parasites present, their location, and the age and general condition of the patient.

Irregular appetite, abdominal pains, nausea, vomiting, diarrhea or constipation, itching of anus or nose, headache, anemia and emaciation are some of the symptoms that may be produced, but any or all of these symptoms may be due to other causes.

A positive diagnosis can only be made by the discovery of a worm, or segments of it, or by the finding of eggs on microscopic examination of the stool. The latter procedure should always be done by someone trained in the method of study and examination.

2. Treatment varies with the species of intestinal parasite present. Worm remedies in general are poisonous. Inasmuch as the treatment depends on poisoning the parasite without seriously poisoning the host, it should be directed by a competent physician.

Teething and Bowel Trouble

To the Editor:—What effect does the eruption of the temporary teeth have on bowel trouble, or the relation of bowel troubles to teething, if any?

B. O. M., Kansas.

Answer.—Dentition has long been blamed for many of the disturbances of infancy. The great majority of normal healthy infants have no symptoms. There may be restlessness, increased salivation and loss of appetite with a slight rise of temperature (1 or 2 degrees). The bowels may be constipated associated with the decreased food intake, or there may be a slight diarrhea.

The result of an improper diet is often made manifest at this time. Infants suffering from nutritional disturbances are more liable to show symptoms and these of a greater severity. In all cases where symptoms develop, other causes than dentition should be considered and will often be found.

Oily Seborrhea
Wetting the Hair Before Combing

To the Editor:—1. What causes oily seborrhea? How should it be treated? 2. Does moistening the hair with water every morning before combing it and then wearing a skull cap made of silk hose for, say an hour, to keep it combed, promote the falling of hair?

F. B. M., California.

Answer.—1. Oily seborrhea is caused in part by local irritation and infection of the hair follicles, and in part by a disturbance of the glands of internal secretion. Treatment is not at all satisfactory as a rule, but occasionally the condition responds to preparations containing salicylic acid and sulphur.

If the production of oil is excessive, irritation of the scalp should be carefully avoided. Vigorous brushing, massage and irritation by ultra-violet light are not to be used.

2. Probably no harm is done in moistening the hair before combing. If there is an oily seborrhea, wearing a close fitting skull cap would not be advisable.

Insomnia
Phobias

To the Editor:—1. For the past year and a half I have been troubled with insomnia, averaging about four or five hours sleep in 24 hours, which I feel sure is caused by nervous exhaustion or what is called neurasthenia or nervous debility. Would very poor teeth in any way cause nervous exhaustion? I need false teeth, but I dread the idea of having them. I know poor teeth often cause rheumatism on account of ulcerative roots. 2. Since I was 14 years old (am now 50), I have had the following phobias: agoraphobia (fear of open spaces) and claustrophobia (fear of closed spaces). What form of insanity are these phobias? Do they usually terminate in the form of insanity called melancholia? Are these phobias and melancholia a sign of degeneracy in a family? Do the best authorities on insanity consider a person with agoraphobia and claustrophobia fit to get married? I have never married on this account. Are such persons fit to have children?

S. F. O., Massachusetts.

Answer.—1. The amount of sleep needed by different persons varies within wide limits and is much modified by habit. Many energetic, active people get along quite well with four or five hours of sleep. The principal harmful effects from not sleeping are caused, not by the insomnia, but by the worry over not sleeping. It is a bad habit to make a business of sleep, which is what people do when they worry over the question whether they are going to be able to sleep. Sleep should and will come naturally if one will only realize that it is rest and not sleep that is needed. Of course it is important to pay attention to the ordinary rules of hygiene, especially at the age of 50, with regard to exercise, fresh air and reasonable diet. But above all, it is important to fill one's life with satisfactory work and play. The best incentive to sleep is still the feeling of "something attempted, something done," particularly something to help others.

With regard to the teeth, by all means take the advice of your dentist. There is no reason to dread false teeth and there is no question that poor teeth may cause not only rheumatism but also various upsets in nutrition and intoxications.

2. The phobias of which the patient speaks are not insanity at all and do not lead to insanity. They are bad habits of thought and feeling. Many people with such fears marry and have healthy children, but there is always the danger that, without realizing or intending it, they may train their children in similar bad habits. Many authorities believe that training is as important as heredity, and that for that reason there is a tendency for such disorders to run in families.

Prevention of Goiter

To the Editor:—Will you kindly answer the following questions pertaining to an enlargement of the thyroid gland, or goiter: 1. What measures may be adopted, other than surgical treatment, to remove this condition? 2. Can this condition be ascribed, remotely or indirectly, to nervous ailments, systemic poisoning or general debility? 3. What other foods besides cocoa or chocolate furnish the necessary supply of vegetable iodin or iodids?

J. G. N., New York.

Answer.—1. Among the measures which exist for the treatment of goiter are the administration of various internal remedies, the injection of certain substances into the goiter and the use of the x-ray. Surgical measures also vary in their extent, from the tying off of the blood vessels to partial or complete removal of the goiter. The method to be adopted in any case depends on a complete study of the patient's condition by the physician.

2. The exact causes of the various types of enlargement of the thyroid gland are not definitely known. The three conditions mentioned, "nervous ailment, systemic poisoning or general debility," are so broad as to include almost any possible disturbance.

3. This question shows a misunderstanding of the use of iodin for the prevention of goiter. Cocoa or chocolate is given, not for any iodin which it contains, but because preparations of iodin have been made with a chocolate coating so as to disguise the taste.

HEALTH REVIEWS

MAKING THE FIT FITTER

"The great need in our civilization is not that of caring for the weak and sick but of making the fit fitter."

So says Dr. Ray Lyman Wilbur, president of Leland Stanford University and of the American Medical Association, in an article in the *Woman's World* for March, entitled "Adding Years to Your Life."

The quickest route toward making the fit fitter, according to Dr. Wilbur, is for apparently healthy persons to have complete physical examinations made at regular intervals. By such means, the body may be protected before actual disease takes place.

"I hope, doctor, that I have not called you in unnecessarily" is a common statement of patient to doctor. Many physicians, too, have been so largely trained in handling the abnormal and the diseased, that they are inclined to pooh-pooh the fears of patients and to give them reassurance without an adequate examination.

The greatest responsibility of the doctor today is to detect the early evidences of disease, and then to give those directions as to general living habits and medical or other care that will, if possible, bring about the restoration of the body to normal.

Nearly all of us suffer to a considerable extent from the anticipation of dangers that never arise. It is a great advantage to have mental repose regarding conditions of the body and to have established habits and the attitude of health.

Mere indifference to what is going on in our bodies is a very different thing and often leads to dire results. The importance of a periodic physical examination is that we are able to transfer over to an expert the responsibility of looking us over and giving us a sailing chart for the future.

WAYS TO TEACH HEALTH

How each study in the schoolroom may be used to teach health is emphasized in an article by Miss Elmira Bears, R.N., on "The School Nurse and the School Teacher" in a recent issue of *Child Health Magazine*.

Monthly weighing and measuring interest a child in his own health, says Miss Bears, and the skilful teacher is the one who will develop this interest through every possible channel.

The writing period may be made to point out a lesson in posture. The art classes may learn of the value of fruits and vegetables through free-hand drawing and poster making.

In arithmetic, the children may keep accounts for the school lunches of milk, at the same time learning something of food values and the relative costs of food.

The native origin of many foods will be brought out in the geography class; the history class may hunt up fascinating information regarding food habits and the sources of food supply of our forefathers.

Simple laboratory experiments made in the classroom will teach children to understand the chemical changes which take place during digestion.

Health plays are written and produced in English and civics classes. Nature study, bird lore and the care of animal pets all offer an excellent opportunity to teach reproduction and the development and growth of the body.

Proper elimination, care of the body, value of sleep and similar lessons may be taught in normal, natural ways as opportunity offers in any of the classes.

In localities where greatest thought has been given to physical examinations of children, Miss Bears says, the best method seems to provide for (1) a preschool, kindergarten or first grade examination; that is, on entrance to elementary school; (2) a fourth or fifth grade examination, and (3) one in eighth, or on entrance to high school, thus reaching the adolescent child.

Such a program also calls for careful supervision between these examinations, a routine inspection for contagion, thorough physical examinations for underweights, and care of emergencies.

IODINE IN CITY WATER

Considerable newspaper publicity has lately been occasioned by the experiment of a certain city using iodine twice a year in the city water supply, for the prevention of goiter.

It is questionable, says the *Bulletin* of the division of health at Dayton, Ohio, whether any benefit results from the infinitesimal amount used in this experiment. At the rate used it would require three months for a user of the water to get an amount of iodine equal to one minimum dose of the drug—provided such person consumed as much as two quarts of water daily.

When it is considered that the iodine is used for only three weeks twice a year and that the average person probably does not consume as much as two quarts of water daily, it appears that the whole matter is largely a farce.

To use a sufficient amount of iodine in the city water to really prevent goiter would cause the water to taste bad and would be a considerable item of expense. Some more practical way of iodine treatment must be developed.

Some consideration has been given in Dayton to the advisability of treating the water at the school buildings only, with iodine. As yet, the town has not been able to overcome all of the handicaps to such a plan.

"PIG BROTHER AND TIDY ANGEL"

A cleanliness game which school children enjoy is called "Pig Brother and Tidy Angel" and is credited to Miss Mary Stucky of Muncie, Ind., by the *Hoosier Health Herald*.

Miss Stucky tells her class of young children the story of "Pig Brother," then together they make a little game out of the story.

Each week she appoints a monitor for each row in her second grade classroom. It is the monitor's duty to inspect the children in his row. He must examine their hands, finger nails, neck, ears and teeth.

If each child in the row is reported clean, with hair tidy, that row is known as "Tidy Angel" row. Any child reported unclean or untidy is designated "Pig Brother."

The record of the rows is posted daily, and a list of "Tidy Angel" rows and "Pig Brother" rows are kept on the board throughout the day.

No child wishes to be a "Pig Brother" and so strenuous efforts at cleanliness are made by the children.